A Report to the Wyoming Legislature

The Wyoming Universal Service Fund

An Evaluation of the Basis and Qualification for Funding

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Prepared by: Olesya Denney, Ph.D.
Warren Fischer, C.P.A.
Timothy Gates
Peter Gose
Mark Stacy

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EXECUTIVE SUMMARY

Purpose

In June of 2004, the Wyoming Legislature, through the Wyoming Legislative Services Office ("LSO") retained QSI Consulting, Inc. ("QSI") to review and analyze the Wyoming Universal Service Fund ("WUSF"). This review is the result of legislation adopting an amendment to the Wyoming budget that set forth the guidelines for the study and the scope of the project. Specifically, the legislation provided funding for a study to be conducted on the current state telecommunications universal service fund, the effects of changing the current fund from a price-based fund to a cost-based fund, implications and desirability of supporting only a single line for each business and residential customer receiving support through the fund, the universal service fund subsidy level and the fund's appropriate structure.[1] In addition to these specific tasks, QSI, in its bid for this project, committed to including an evaluation of the potential impacts of new, low cost telecommunications technologies on the WUSF.

Cost Basis for Wyoming Universal Service Fund

There are at least three methods of generating the underlying carrier costs to be used for purposes of establishing a cost-based universal service support mechanism: (1) an embedded cost methodology; (2) a total service long run incremental cost ("TSLRIC") methodology; and (3) a methodology that relies upon the Federal Communication Commission's Synthesis, or High Cost Proxy Model ("HCPM") to generate cost estimates. Because each methodology is subject to valid criticism, the Federal-State Joint Board on Universal Service has recently sought specific comments on how underlying costs should be determined, specifically asking whether forward looking costs (such as those generated by the HCPM and TSLRIC methodologies), embedded costs, or some

[1] State of Wyoming Department of Administration and Information Procurement Section Request for Proposal No. 0331-L. Opening Date and Time May 14, 2004 ----2:00 p.m.

other method should be used. Because there is significant debate regarding each of these cost bases, and in order to provide the Wyoming Legislature with the most value and the most complete information, QSI has generated cost estimates using each of the three methods identified above.

QSI's analysis demonstrates that the effects on the fund are heavily dependent upon not only the availability and quality of the data that is available for analysis, but also upon the methodology employed to estimate costs. In fact, results of the analysis vary, depending upon these factors. QSI would therefore caution this Report's readers from drawing any final conclusions regarding the effects of changing from a price- to a cost-based fund until (1) a complete and comparable (both carrier to carrier and vintage) set of data can be used to perform the analysis and (2) a determination can be made regarding the most appropriate methodology to be used for estimating costs.

Although, due to data issues discussed at length in this Report, it is not possible to draw any absolute conclusions with respect to the effects of changing from a price- to a cost-based WUSF, QSI is able to provide the Legislature with high-level observations regarding this issue. Because the current funding mechanism is price-based, and because telecommunications rates in Wyoming may or may not have any correlation with the underlying cost of providing service, maintaining the WUSF as it currently exists may not serve the purpose of accomplishing the objectives of universal service. This is because when rates and costs are not related, distribution of funds is a function, not of the underlying cost of providing telecommunications service, but of the rates the carrier is allowed to charge its customers. Because the WUSF is intended to maintain the affordability of telecommunications services by providing an explicit subsidy to those consumers in *high cost* areas of Wyoming, and since a cost-based fund would measure those needs directly, a cost-based fund would be more effective than a price-based fund in ensuring that funding flows to consumers as intended. Therefore, the effects of changing from a price- to a cost-based fund would likely be positive. In order to get a more complete picture of the expected effects of such a change, it would be necessary,

first, to establish a proper cost basis for funding, and second, to examine all the relevant revenue streams of Wyoming carriers that might be attributing to the funding of local service.[2] The WPSC is uniquely suited to examining these issues. Therefore, QSI recommends that the Legislature consider directing the WPSC to open an investigatory Docket that would address these issues, and implement changes to the WUSF that are consistent with the Legislature's policy objectives.

Single Versus Multiple Line Funding

The second objective of the study funded by the Wyoming Legislature is to examine the implications and desirability of supporting only a single line for each business and residential customer receiving support through the fund. QSI met this objective by providing the Wyoming Legislature with the "*implications"* of funding only a single line. While QSI has provided the Legislature with high level observations regarding this issue, QSI has abstained from providing comment regarding the "*desirability*" of such an action, since that judgment is best made by policy makers such as the Wyoming Legislature and implemented by the Wyoming Public Service Commission ("WPSC"). Although QSI has provided its observations regarding this issue, by providing the associated implications of funding single lines only, decision makers may reach their own conclusions relative to the desirability of changing the current support structure.

On an aggregated basis, approximately 17% of the total lines receiving support from the WUSF can be categorized as "additional lines." Relying upon data provided by Wyoming Telecommunications carriers and data from the Manager of the WUSF, QSI calculated the approximate number of additional lines currently receiving support in Wyoming to be 6,316. The approximate amount of WUSF funding that is currently devoted to funding these lines is $423,175. Based upon the WPSC's current WUSF

[2] Examples of relevant revenue streams include federal USF support and access service.

assessment level (1%), Wyoming consumers contribute less than $0.10 per month (less than $1 annually) in order to provide this support.[3]

There are numerous arguments, both pro and con, for implementing a policy change to use the WUSF to support a single line as opposed to continuing the current practice of funding multiple lines. It can be argued for example, that funding a single connection is adequate for achieving the goals of the Wyoming Telecommunications Act, that funding multiple lines would be inconsistent with the goals of the Wyoming Act, and with the goals of universal service. Further, by funding additional lines, the size of the WUSF is increased, as is the burden on Wyoming telecommunications consumers who are responsible for contributing to the fund. However, based upon QSI's analysis, the impact to customers contributing to the WUSF would only amount to approximately $0.10 per month if a change was implemented that would make only primary lines eligible for WUSF support. Moreover, the impact to customers currently receiving support for additional lines would be relatively significant, with some customers experiencing rate increases for additional lines of up to 188%. Such increases could negatively impact the prospects for economic development in small rural communities in Wyoming. Additionally, there is some potential that carriers currently providing service in Wyoming may have reduced incentive to maintain and advance their networks if this portion of universal service funding is no longer available. Finally, carriers have historically resisted the implementation of such a change on the grounds that it would be administratively and logistically difficult, if at all possible, to track primary lines, and that limiting funding to single lines is therefore an unachievable objective.

Based upon QSI's analysis, it appears that, although maintaining the status quo would be counter to a policy that would ensure that both consumers and potential entrants to the market receive appropriate price signals, and that would minimize subsidy levels, significant administrative issues make implementation of a single line policy difficult if at

[3] Based on a monthly phone bill of $50.

all possible to achieve.[4] Although, in aggregate, savings to the WUSF associated with funding a single line only would amount to approximately half a million dollars, the per-contributing-customer savings would be *de minimus* (less than $1 per year). The significant negative impact to customers currently receiving benefits from the practice of funding multiple lines combined with the other issues mentioned previously could easily exceed any positive impacts associated with curtailing the practice. Unless and until the issues raised by carriers associated with tracking primary lines can be resolved, it appears to make sense to leave the current practice in place. If and/or when it is possible for carriers to track primary lines in an efficient manner that would result in a net benefit to the State's telecommunications consumers, QSI recommends that the WPSC re-examine this issue.

Technological Impacts on Wyoming Universal Service Fund, and Potential Alternate Uses for Funding

The last few years have seen an explosion of new technologies used to augment, compliment or replace traditional telecommunications services. These technologies include VoIP, wireless, Wi-Fi, Bluetooth, WiMAX, Mobile-Fi, UltraWideband, and Broadband Over Power Line. These new technologies offer the potential of greatly reducing the costs associated with providing telecommunications services – even to customers located in rural areas. To the extent that the Wyoming Legislature eventually chooses to implement changes to the current structure of the WUSF that result in savings to the fund, perhaps those savings could be used in such a way that would encourage the development of these technologies in the state. Such an investment in Wyoming's future may provide long-term benefits to the State by eventually eliminating the need for universal service funding in what are currently "high cost" areas.

[4] Even the Federal-State Joint Board on Universal Service makes its recommendation to fund single lines only conditional on the FCC's ability to develop rules and procedures that do not create undue administrative burdens.

Should the implementation of such technologies in Wyoming become reality, it would be possible to accomplish the goals of universal service in Wyoming, relying not on a system of subsidies and governmental programs, but on the free market and competitive forces. Therefore, in the near term, given this tremendous potential, QSI recommends that the Legislature considers providing additional funding for a study to accomplish the following critical objectives:

1. Identify technologies appropriate to Wyoming that could potentially eliminate the need for the WUSF by decreasing the costs of essential telecommunications services in rural and high cost areas of the State.
2. Examine potential avenues that would encourage the development of these technologies and that would allow these technologies to be brought to the market in Wyoming.
3. Examine potential regulatory roadblocks that exist and must be overcome before these technologies could be deployed in the state.
4. Project potential long-term savings to the state of such deployment.

INTRODUCTION

Brief History of the Wyoming Universal Service Fund

The Wyoming Telecommunications Act was signed into law on March 1, 1995, containing provisions for the establishment of a Wyoming Universal Service Fund ("WUSF") to be administered by the Wyoming Public Service Commission ("WPSC").[5] The purpose of the WUSF is to ensure the general availability of essential telecommunications services at affordable and reasonable prices. The WUSF is designed to assist persons with higher priced local services by indirectly providing monetary support to these customers. Wyoming law requires that all telecommunications companies contribute to the WUSF, and that, to the extent that a company's local exchange service rates, after consideration of any contributions from the federal universal service fund, exceed one-hundred thirty percent (130%) of the statewide average local exchange rate, telecommunications companies shall receive distributions from the WUSF.[6] Those distribution are used by the telecommunications companies to keep rates affordable in high cost parts of the State. Since the establishment of the WUSF, several statutory changes have been made to expand the services covered by the fund, including the 2001 addition of W.S. 37-15-502 to cover cellular, radio spectrum and other wireless technologies which are critical to the citizens of Wyoming.

As a result of the Wyoming Telecommunications Act, the WPSC wrote and implemented rules that further define the working of the WUSF. The WPSC's rules became effective on February 14, 1997. Subsequent to issuing its rules, the WPSC contracted with the National Exchange Carrier Association, Inc. ("NECA") in the spring of 1997 to manage the WUSF. Subsequent to the expiration of the NECA management contract, the WPSC contracted with James T. Dinneen, Esq. of Lathrop and Rutledge, P.C. to succeed NECA

5 W.S. § 37-15-101

6 W.S. § 37-15-101(d)

as the WUSF Manager. The WUSF is currently administered directly by the WPSC. The current Manager of the WUSF, Mr. Michael Korber, is a WPSC employee.[7]

Currently, WUSF support is received by six carriers in Wyoming. These carriers, the number of lines supported, and the percent of lines supported for the fiscal year beginning July 1, 2004 in presented below in Table 1.[8]

Table 1

Carrier	*Supported Lines*	*Percent Supported Lines*
All West Communications, Inc.	318	0.86%
Chugwater Telephone Company	261	0.70%
Qwest Corporation	29,775	80.14%
Union Telephone Company	5,723	15.40%
Sprint/United	1,027	2.76%
VP Telecom, dba Orbitcom, Inc.	49	0.13%
Total	37,153	100.00%

As can be seen above, the vast majority of the current support benefits customers of Qwest.

After considering the WUSF's projected funding needs, the WPSC issues an annual order establishing the assessment rate that is applicable for a 12 month period beginning July 1 of each year. All Wyoming telecommunications carriers collect this assessment from their end use customers. However, based on the projected fund balance as of June 30, 2004, and the amount of support needed to fund these carriers for the 2004-2005 fiscal year, the WUSF Manager and the WPSC determined the assessment could be waived for one year. The WPSC determined, based on projected needs and the current fund balance, that no additional contributions would be required for a one year period.

[7] QSI would like to recognize the efforts of Mr. Korber in providing invaluable assistance to QSI on this project.

[8] Source: Wyoming Universal Service Fund Manager.

Discussion of the Project

In June of 2004, the Wyoming Legislature, through the Wyoming Legislative Services Office ("LSO") retained QSI Consulting, Inc. ("QSI") to review and analyze the WUSF. This review is the result of legislation adopting an amendment to the Wyoming budget that set forth the guidelines for the study and the scope of the project. Specifically, the legislation provided funding for a study to be conducted on the current state telecommunications universal service fund, the effects of changing the current fund from a price-based fund to a cost-based fund, implications and desirability of supporting only a single line for each business and residential customers receiving support through the fund, the universal service fund subsidy level and the fund's appropriate structure.[9] In addition to these specific tasks, QSI, in its bid for this project, committed to including an evaluation of the potential impacts of new, low cost telecommunications technologies on the WUSF.

QSI has undertaken this project and presents the methodologies, analyses and results of that effort in the following sections of this Report to the Wyoming Legislature ("Report"). At the outset, it should be clear that QSI fully understands that the policy decisions regarding the basis of the WUSF and the option to fund single or multiple connections are properly made by the Wyoming Legislature or other regulatory bodies and decision makers. QSI's role, therefore, in conducting this analysis is to analyze existing data, and to present facts – not to act as an advocate for any particular changes to the WUSF. Further, QSI recommends that prior to decision makers reaching any final conclusions with respect to these issues, these issues should be vetted in the context of a formal proceeding before the WPSC. In such a forum, the WPSC can develop a full and complete record, in which all concerned parties will have the opportunity to present their positions through sworn testimony.

[9] State of Wyoming Department of Administration and Information Procurement Section Request for Proposal No. 0331-L. Opening Date and Time May 14, 2004 ----2:00 p.m.

This Report and the associated analyses were data intensive. In addition to utilizing publicly available data, QSI has benefited greatly from assistance provided by the Manager of the WUSF, Mike Korber and his Staff. Additionally, QSI sought information directly from Wyoming telecommunications carriers. QSI solicited information needed for the Report through requests for information that were sent to Wyoming carriers in the form of a letter dated July 2, 2004. Finally, in order to complete one of the cost estimate methodologies (discussed below), it was necessary for QSI to purchase data from an independent firm who has exclusive rights to that data. Much of the data provided to QSI by Wyoming telecommunications carriers is confidential, and may be competitively sensitive. Therefore, it was necessary for QSI to enter into a number of confidentiality agreements with certain carriers providing telecommunications services in Wyoming before QSI could gain access to this data. A great deal of time and effort went into the completion of these agreements. In fact, the last of these agreements was not even provided to QSI until early September (a full 60 days after QSI initially requested the information from the carriers). In order to protect carriers' data that is confidential, and potentially competitively sensitive, these agreements prohibit QSI from including any carrier-specific confidential data in this Report. It is for that reason that the results of QSI's analysis are presented in an aggregate, rather than company-specific format.

It should be noted that QSI experienced varying levels of cooperation from Wyoming carriers as it relates to their willingness to provide QSI with the necessary data to accomplish the Legislature's objectives. For example, QSI sent the letter requesting information to wireless as well as wireline carriers QSI received no responses from wireless carriers. With regard to wireline carriers, even after confidentiality agreements had been signed, QSI experienced significant delays both in receiving the requested data, and in receiving answers to clarification questions regarding initial data responses. These continuous delays disrupted QSI's ability to perform its work in a timely manner, and in fact, resulted in a delay of the completion of the first draft of this Report.

The reluctance on the part of certain carriers to cooperate can be interpreted in a number of ways. It is possible that carriers were truly concerned that QSI would mishandle or disclose proprietary data, even though confidentiality agreements had been executed. QSI finds no merit in this interpretation, as QSI has entered into literally hundreds of such agreements in the past with dozens of telecommunications carriers. QSI has never breached any confidentiality agreement it has entered into, and QSI ensures that all of its personnel sign such agreements before receiving access to proprietary carrier information. In short, QSI's record for maintaining the confidentiality of sensitive data is spotless. A second, interpretation of this recalcitrance on the part of certain carriers is that they simply have nothing to gain by cooperating with the Legislature's consultants. If this interpretation is valid, it should concern the Legislature in that the WUSF is expressly intended to assist telecommunications customers in Wyoming, and not to benefit the carriers or their shareholders. Finally, it may be that the wireless carriers simply believe that because they are not regulated that they do not have any obligation to respond to requests from the Legislature or its consultants.

QSI strongly urges the Wyoming Legislature to consider the impacts and ramifications of any implemented changes to the WUSF from a public interest perspective which takes into account not only consideration of Wyoming telecommunications carriers, but also the telecommunications consumers of Wyoming – both those who pay into the WUSF, and those who benefit from the Fund.

PRICE VERSUS COST BASIS FOR THE WUSF

Theory: What to Expect When Moving from a Price-based to Cost-based Fund

In a perfectly competitive market prices tend to be driven to forward-looking economic costs (which includes a reasonable profit). Under these textbook conditions, there would be no difference between a price-based and a cost-based fund. Although actual telecommunications markets are imperfect (in an economic sense), Wyoming law requires that local telephone service be priced at the levels equal to or greater than the TSLRIC (forward-looking economic) cost. If the company complies with the law, and the TSLRIC costs are measured accurately by both the carrier (price-setter) and the fund administrator (support setter), two situations are possible:

1) Prices are equal to TSLRIC. In such case a switch from a price-based to a cost-based fund (other things such as the benchmark level being constant) would not have an effect on the size of the fund, the number of lines supported or the distribution of the fund between supported carriers.

2) Prices are higher than TSLRIC. In this case a movement to a cost-based fund (the benchmark level being constant) would result in a reduced fund size (because the difference between the costs and the benchmark is smaller than the difference between the prices and the benchmark). If the price of one carrier reflects a greater mark-up over cost than the price of the other carrier, the distribution of the fund between companies might change significantly.

Because Wyoming telecommunications service rates are, in general, at levels in excess of TSLRIC, a move to a cost-based fund would – theoretically – result in a smaller fund size, and, correspondingly, fewer lines would be supported. The extent to which the fund decreases obviously depends upon the carriers' costs. As discussed in the next section of

this Report, the proper identification of these costs can be challenging, and in some cases, the results do not prove out the theory.

Approaches to Estimating Costs

In order to gauge the potential impacts associated with changing the WUSF from a price-based fund to a cost-based fund, it is necessary to compare the current price-based fund to hypothetical funds, which are based not on price, but on cost. There is no generally agreed upon empirical measure of cost to be used for purposes of establishing a cost-based universal service support, and therefore, QSI is presenting a range of costs for this Report. There are at least two alternative methodologies – *embedded* and *forward-looking costs*, and within the forward-looking methodology there are two approaches to calculating costs -- (1) an approach that utilizes total service long run incremental cost ("TSLRIC") studies filed with the Commission by Wyoming carriers; and (2) an approach that relies upon industry Cost Proxy Models (such as the Federal Communications Commission's "Synthesis Model") to generate cost estimates.

Although the forward-looking cost methodology is generally considered as theoretically preferable because it provides the companies with the correct market incentives, the practical implementation of forward-looking cost methodology presents certain difficulties, especially when considered for rural carriers. Specifically, on the federal level the FCC uses its forward-looking Synthesis cost proxy model to determine the federal high-cost support for non-rural carriers. At the same time the FCC determined that rural carriers should, in the interim period (which ends in June 2006), be funded based on the modified embedded cost mechanism. Similarly, states typically adopt different costing standards for rural and non-rural companies. In our region of the United States, where most states utilize cost-based rather than price-based universal service mechanisms, such dual approaches are used by Arizona,[10] Colorado[11] and Oregon state

[10] Arizona Administrative Code, Title 14, Chapter 2, Article 12.

[11] 4 Code of Colorado Regulations 723-41.

funds.[12] For example, Oregon uses the FCC Synthesis Model to fund its non-rural companies, and the embedded cost as the basis for inclusion of rural companies in its universal service fund mechanism.

The appropriate mechanism to establish universal service support for high-cost rural carriers is currently a topic of much debate at both the national and state levels. In fact, the Federal-State Joint Board on Universal Service ("Joint Board") recently sought comments from interested parties relating to these very issues.[13] Because each methodology is subject to valid criticism, the Joint Board has sought specific comments on how underlying costs should be determined, specifically asking interested parties whether forward looking costs (such as those generated by the Synthesis Model ("SM") and TSLRIC methodologies), embedded costs, or some other method should be used. Because there is significant debate regarding each of these cost bases, and in order to provide the Wyoming Legislature with the most value and the most complete information, QSI has generated cost estimates using each of the three methods identified above. The analysis for each methodology, along with a more thorough discussion of the strengths and weaknesses associated with each methodology is presented below.

Embedded Cost

Should the WUSF be migrated from a priced based fund to a cost-based fund, one alternative for consideration of the costs is to gather actual or embedded costs. In order to determine the costs for a finished service, actual cost data would be required that would include non-traffic sensitive (NTS) costs for loops and transport and traffic sensitive costs for switching.

[12] Oregon PUC Order 00-312 dated June 16, 2000 and 03-082 dated February 3, 2003.

[13] Public Notice, Federal-State Joint Board on Universal Service Seeks Comment on Certain of the Commission's Rules Relating to High-Cost Universal Service Support. CC Docket No. 96-45. Release August 16, 2004.

The initial[14] federal High Cost Fund focused on support for carriers that experienced high loop costs. More specifically, the unseparated non-traffic sensitive revenue requirement per loop was used as a benchmark for determining eligibility to receive funding from the high cost fund. At this juncture it may be useful to break down the terms described above. Starting from the end, we have the term revenue requirement. Revenue

[14] After 1997, as a result of the Universal Service provisions of the Telecommunications Act of 1996, the federal Universal Service Fund now encompasses [1] loop support; [2] long-term support ("LTS"), and [3] local switching support. ("LSS").

LTS comprises certain non-traffic sensitive costs and provides support to the members of the National Exchange Carrier Association (NECA) common line pool, to allow them to charge a below-cost carrier common line ("CCL") rate that is uniform for all companies in the pool. Before 1989, all exchange carriers were required to be part of the NECA common line ("CL") pool, and CCL rates were uniform nationwide. The transition to jurisdictionally specific CCL access charges occurred on April 1, 1989. At that time a number of carriers withdrew from the NECA CL pool. To reduce disparities in CCL rates among LECs after companies were permitted to withdraw from the CL pool, two support mechanisms were set up. Transitional support consisted of payments from low-cost companies that withdrew from the pool to high-cost companies that withdrew from the pool. The transition period has now ended. Long term support ("LTS") originally consisted of payments to the NECA CL pool from companies that withdrew from the NECA CL pool. Companies remaining in the NECA pool had identical CCL rates, which were formerly equal to the average CCL rate of the price cap companies. Effective January 1, 1998, the funds for LTS came from the new federal universal service support mechanisms. At the same time, the NECA pool rate no longer was made equal to the average price cap rate. Instead the amount of LTS that a NECA pool member is eligible to receive in 1998 is the 1997 level of LTS (the difference between 1997 CCL revenue requirements and the sum of 1997 CCL revenues using the NECA pool rate and 1997 subscriber line charge revenues) multiplied by the by the rate of growth of the national average NTS cost per loop.

The third federal high-cost support mechanism, LSS, is related to traffic sensitive local switching costs. The local switching support is now recovered through the universal service support mechanisms, rather than through higher traffic-sensitive access charges. Until 1997, this support was based on dial equipment minute ("DEM") weighting. LSS provides support to LECs with study areas of 50,000 or fewer access lines, to help defray the higher switching costs of small LECs. The portion of these costs which are normally allocated to interstate is determined by the ratio of interstate to total dial equipment minutes, known as the DEM factor. However, local exchange carrier study areas with 50,000 access lines or fewer had that portion multiplied by a weighting factor, which was determined by the number of access lines in the study area.

Each of the three universal service support mechanisms have been administered by the Universal Service Administrative Company ("USAC"). As part of their administration of these support mechanisms, USAC has filed quarterly reports that include quarterly projections of the amounts to be paid for each program, along with true-ups (differences between actual payments and projections) for prior periods, administrative expenses and interest income.

As part of the administration of the USF program, NECA collects certain cost data from LECs that provide service to the vast majority of the nation's subscribers. Each year NECA collects NTS cost and loop data from the previous year, and uses that information to distribute high-cost assistance in the following year.

requirements have historically been defined as the amount of revenue a utility must generate to cover its operating expenses, pay associated taxes, and earn a reasonable return on investments. The term "non-traffic sensitive" refers to costs that do not change as usage varies. The cost of the copper wire from a telephone company central office to the premises of a customer does not change if the customer makes or receives one call per month or if that customer places or receives hundreds of calls each day. Finally, the term "unseparated" is used to indicate that the entirety of the non-traffic sensitive costs are included. For purposes of developing access charges[15], costs are "separated" into state and federal "buckets".

The initial high cost fund gathered the total revenue requirement for unseparated non-traffic sensitive costs and divided that amount by the number of loops for a particular company to express that company's revenue requirement on a per loop basis. That figure was used as an input to determine the amount of support each company would receive from the high cost fund.

If a future determination is made that the WUSF should be based on cost, and more specifically embedded costs, a decision would be required as to whether non-traffic sensitive costs would serve as the basis for the fund, or whether all embedded costs (to include not only loop costs, but also traffic sensitive costs such as switching) that are incurred to provide a finished telecommunications service should be included.

Comparison of Average Monthly Rates to Embedded Loop Cost

Given the geography of Wyoming and the barriers of distance and density that face telecommunications carriers in Wyoming, one observation that quickly becomes apparent is that the loop cost is one of the single most important components. Differences in terrain and distances between customers vary substantially among Wyoming companies.

[15] Access charges are a mechanism in which long distance carriers compensate the local telephone company for originating or terminating a long distance telephone call.

Having made these observations, QSI has drawn a rough comparison between the unseparated NTS revenue requirement per loop, current rates as compiled by WPSC[16] and the weighted average monthly phone rates[17] for 2001 that were calculated by the WUSF fund administrator.

Table 2

	2002 Unseparated NTS Monthly Revenue Requirement Per Loop (NECA 2003 submission)	2004 Residential Rates		Wyoming 2001 Weighted Average Monthly Phone Rate
		Lowest	Highest	
ALL WEST	$ 31.18	$ 59.52*		$22.00
UNITED	$ 43.99	$ 27.48	$ 91.36*	$37.35
MOUNTAIN BELL-WY	$ 32.98	$ 23.1	$ 69.35*	$28.37
CHUGWATER	$ 44.94	$ 38.2*		$11.76
UNION	$ 47.69	$ 40.95*	$ 88.47*	$45.42
RANGE **	$ 53.54	$ 16.00*	$ 25.9*	$16.87
SILVER STAR	$ 65.57	$ 24.5		$18.80
TRI-COUNTY ***	$101.10	$ 27.31	$ 45.08*	$45.00
DUBOIS	$ 74.48	$ 19.25		$21.07
CENTURYTEL OF WY.	$ 35.74	$ 15.00	$ 28.00	

* -- before credits for federal and Wyoming USF support.
** -- with RT Communications
*** -- with TCT West

From the data presented above it is apparent that there is no direct correlation between the unseparated NTS revenue requirement per loop and the weighted average monthly phone rates. We believe that this data provides a reasonable basis for observing that there

16 Short WPSC Telecommunications report Table B revised on 7/1/2004.

17 In addition to the $16.87 rate for RT (Range), the WUSF administrator also calculated a $11.63 weighted average rate for Range. In addition to the $22.00 rate for All West – Wyoming, the WUSF administrator also calculated a $13.81 weighted average rate for All West Communications. In addition to the $45.00 rate for Tri-County Telephone Association, the WUSF administrator also calculated a $31.82 weighted average rate for TCT West.

appears to be little relationship between historic loop costs and weighted average monthly phone rates. This observation is not unexpected. Given that the rate design of each telecommunications carrier in Wyoming will be different based on factors other than just the local rate (e.g. access charge revenues, revenues from vertical services, and revenues from support mechanisms) it is to be expected that local rates may indeed deviate from embedded costs. Nevertheless, the disconnect between rates and prices is a concern which will be addressed later in this Report.

Conclusion

Embedded costs can certainly be used as a basis for the WUSF. Embedded costs have provided a solid foundation for the federal high cost and Universal Service mechanisms. Gathering embedded cost data and presenting it on a uniform basis for all exchange carriers can be an enormous undertaking. Should it ultimately be decided that the WUSF should be migrated to a cost basis and that embedded costs are the best alternative, consideration should be given to data that can be gathered from sources such as the USAC. Finally a decision respecting whether a WUSF based on cost should consider loop costs only, or the cost of the entire finished telecommunications service would be required. Until such time that these decisions are made, it would be conjecture to estimate the impacts on the size of the present WUSF.

Total Service Long Run Incremental Cost

Total Service Long Run Incremental Cost Background

According to the Wyoming Telecommunications Act at W.S. §37-15-103(a)(xiii) Total Service Long Run Incremental Cost ("TSLRIC") is defined as ". . . the total forward-looking cost, using least cost technology, for a telecommunications service or basic network function that the telecommunications provider would incur if it were to initially offer such telecommunications service or basic network function; . . . ." W.S. §37-15-402 states that telecommunications companies which offer non-competitive services must

price each of its services at least at a level that allows the service to recover its own total service long run incremental cost. This is intended to eliminate implicit subsidies and to encourage competitors to enter the market on a level playing field.

Advantages of Using TSLRIC Cost Data

As discussed previously, one of the methodologies QSI has relied upon to estimate costs of carriers for purposes of this Report is the TSLRIC cost methodology. QSI chose to rely on this methodology, in part, because TSLRIC data is Wyoming-specific, and it is a somewhat readily available source of the forward-looking cost of local exchange service. Since the TSLRIC cost studies filed with the WPSC are classified as confidential, QSI submitted data requests in early July 2004 to 20 carriers providing local service in Wyoming: 1-800 Reconex, Inc., Advanced Communications, Technologies, Inc., All West Communications, Inc., Century Tel of Wyoming, Inc., Chugwater Telephone Company, Columbine Telephone Company, Comm South Companies, Inc., Dubois Telephone Exchange, Inc., Golden West Telecommunications Cooperative, Inc., McLeodUSA Telecommunications Services, Project Telephone Company, Qwest Corporation, Range Telephone Cooperative, Inc., Regal Telephone Company, RT Communications, Inc., Silver Star Communications, Sprint/United Telephone Company of the West, TCT West, Inc., Union Telephone Company, and VP Telecom dba Orbitcom, Inc. We requested line count, usage and copies of the TSLRIC cost studies filed with the WPSC.

Of the 20 carriers surveyed, only the incumbent local exchange carriers would have been subject to the TSLRIC filing requirement for non-competitive services. Because of the confidential nature of each carrier's TSLRIC data, QSI was required to sign confidentiality agreements restricting the use of such data to QSI's consultants. QSI did not receive the requested data directly from all of the carriers. In many cases, QSI was referred to the WPSC to obtain copies of the required studies, if available.

QSI's initial objective in using each carrier's TSLRIC data was to compare their forward-looking cost of service to a cost-based benchmark to determine the amount of WUSF support each carrier was eligible to receive. However, to determine a cost-based benchmark, TSLRIC cost data is required for each carrier that is a potential recipient of WUSF support so that a state-wide average TSLRIC cost can be calculated as the basis of a new benchmark. This calculation would be similar to the current price-based methodology where local service revenue net of federal USF support is divided by lines in service to derive the statewide average rate. The TSLRIC approach would require the calculation of extended TSLRIC costs in a manner similar to how local service revenue is calculated: by exchange and by zone. The extended TSLRIC costs of all carriers would then be divided by lines in service to derive a statewide average TSLRIC. Since we did not have the necessary TSLRIC data to perform this calculation, we chose to compare carrier TSLRIC amounts by exchange and zone to the current price-based benchmark for the fiscal year ending June 30, 2005 ("FY 2005"), $31.67 per line, which was provided by the WUSF Manager. Additionally, use of the current price benchmark reflects a WPSC determination of local service affordability. Consequently, it is a reasonable surrogate for our purposes.

We identified each carrier's line count and TSLRIC by exchange (and zone where applicable) from cost studies or WPSC orders approving TSLRIC studies. Federal USF receipts per line by zone, as provided by the WUSF Manager, the carrier's tariff and the Universal Service Administrative Company's ("USAC") 2003 Annual Report, were subtracted from the TSLRIC. We also subtracted other relevant support amounts received by the carriers for the federal Subscriber Line Charge. The resulting net TSLRIC by zone was then compared to the current price benchmark to identify which zone qualifies for WUSF support. If the net TSLRIC was greater than the benchmark, the essential residential and business service lines in the eligible exchange or zone, as identified by the carriers in response to discovery, were then multiplied by the difference between the net TSLRIC and the benchmark to determine the monthly WUSF support for that exchange or zone. This algorithm is illustrated as follows:

- TSLRIC less Federal USF by exchange or zone = Net TSLRIC by exchange or zone.
- If Net TSLRIC is greater than or equal to the benchmark of $31.67, then compute the difference.
- Multiply the difference by essential service lines for that exchange or zone = monthly support.

Results of TSLRIC-Based Calculation

In our analysis, we noted that a reduction of approximately 17% would occur in the amount of WUSF support required because some of the carriers had TSLRIC price floors that were significantly lower than the statewide price benchmark after adjusting the TSLRIC calculations for projected 2004 federal USF support. Other carriers would receive increased support under the TSLRIC approach because their federal support has declined since their original TSLRIC net of federal support was calculated. The aggregate results of our analysis are shown below:

	FY 2005 BASED ON		
	PRICE	TSLRIC	INCREASE (DECREASE)
TOTAL FY 2005	**$ 3,644,436**	**$ 3,042,623**	**$ (601,813)**

Disadvantages of TSLRIC-Based Determination

The TSLRIC approach suffers from at least two of disadvantages that diminish its reliability for this investigation based upon the data that is currently available. First, the TSLRIC data filed by each carrier was not produced by a uniform system of principles or methodologies. Each carrier either filed an internally developed cost study based upon that carrier's interpretation of the WPSC's TSLRIC rules or it relied upon a model

developed by another carrier as a cost proxy. Second, the time frame of the costs studies vary significantly from one carrier to the next as some have filed only a single version of TSLRIC costs with a vintage dating back as far as 1998. Other carriers have had their TSLRIC studies approved as recently as 2003. Consequently, differences in the TSLRIC data by carrier could be caused by the differences in methodology and study vintage as well as true differences in operating costs. If the Legislature or the WPSC choose to rely upon TSLRIC data for WUSF support determination, carriers should be required to produce current TSLRIC data using relatively uniform cost methodologies.

One concern that has been expressed by some of the carriers was the absence of cost data from all local service providers, especially those who may seek WUSF support but who are not included in the calculation of overall WUSF support. Some alternative providers of local service such as wireless carriers are not currently required to file TSLRIC cost data; nor are their local service revenue used in the calculation of the current price-based benchmark. If such carriers were included in the calculation of a statewide TSLRIC-based benchmark or price benchmark used in our analysis, their costs or revenue could produce a lower benchmark than the one based upon price.[18] This would increase the number of lines eligible for support as well as the amount of support per line resulting in a larger fund size.

The converse could also be true. In response to our discovery, one of the smaller wireline carriers relied upon the TSLRIC model used by one of the wireless carriers, and it provided a copy of the results to QSI. Our review of the study results indicate that this wireless carrier had fairly high operating costs per line which would raise the benchmark beyond the current level. A higher benchmark coupled with no change in the other carriers' TSLRIC costs would reduce the amount of support each of those carriers receives today.

[18] This is true assuming that, in general, in the provision of telecommunications service, wireless carriers have lower associated costs than do wireline carriers.

Cost Proxy Model

The Model

The final approach used by QSI to estimate costs of local service was to use a cost proxy model – an engineering cost model that has been developed by the industry. The main advantage to using this approach is that it uses a uniform set of principles. Such a uniform system of principles is particularly important when the costs generated by the study are to be used for funding universal service because costs of various companies are compared. For example, TSLRIC studies filed with the WPSC by local exchange carriers are based on different approaches[19] and reflect different time periods. It is possible that some of the observed differences in the above mentioned TSLRIC results are caused by the differences in methodologies or vintages of the data, rather then the true variations in costs. (It is also possible that one approach systematically under-estimates costs, while another approach systematically over-estimates costs.) In other words, what matters most for a cost-based fund are *relative* differences in costs, and the use of the same cost model for all companies provides better accuracy than comparing cost estimates across various models. The proxy model used by QSI has this advantage.

QSI chose to use the FCC Synthesis Model as a cost proxy model that estimates costs of various local exchange companies. This model calculates forward-looking (TSLRIC) costs of local telephone service and has been developed by the FCC[20] specifically for the purposes of universal service funding. This model received a great deal of scrutiny from various interested parties, including the *Rural Task Force*[21] that pointed out a number of

[19] A review of the WPSC orders related to the carriers' TSLRIC study shows that these studies are based on different models. Qwest uses its own model, while independents use various competing approaches, including their own studies, the HAI model (sponsored by AT&T and MCI), the BCPM (original sponsored by large ILECs), and Western Wireless model (which is based on the HAI model).

[20] The model represents a synthesis of various competing approaches, predominantly the FCC staff's HCPM block that designs distribution and feeder plant, and the switching and expense blocks of the HAI model sponsored by AT&T and MCI. Note that distribution and feeder plant typically constitute a majority of costs of local service.

[21] The Rural Task Force was established by the Federal-State Joint Board on Universal Service in 1998 with the task to develop a forward-looking high cost support mechanism for rural carriers. The Rural Task Force ended in 2000, and its publications are archived on the site http://www.wutc.wa.gov/rtf.

deficiencies in the model when used to estimate costs of rural local exchange carriers.[22] The model is well documented and available publicly, and the FCC provided extensive reasoning for the choice of the model inputs in its *Inputs Order*[23]. Currently the Synthesis Model is being used to determine federal high-cost support for non-rural carriers (represented by Qwest in Wyoming). A number of state utility commissions are using or had used it to determine levels of state support for non-rural carriers. Among them are two commissions in the West – Oregon, which uses it currently with its own modifications to the inputs, and Colorado, which had used it in the past.[24]

As mentioned above, the FCC is not using the Synthesis Model to fund rural companies – a decision that was based in part on the recommendations of the Rural Task Force. The Rural Task Force identified a number of reasons why the model under-estimates costs of a rural carrier. Among these reasons were issues that may be addressed through more accurate inputs, such as incorrect line counts and their incorrect distribution between wire centers, unreasonable plant mix (of aerial, buried and underground cables) and insufficient levels of overhead expenses. However, as we explain below when discussing the results of our estimation, the model appears to generate cost estimates that are higher than current prices or the TSLRIC results filed by the carriers with the WPSC, which suggests that the model might be over-estimating, rather than under-estimating per line costs.

Issues with the Wyoming Database

One of the specific inputs to the model is a customer location database. This database has to be licensed from a private vendor[25] that has exclusive rights to this database. Because of the complexity involved in its generation, this database is not updated regularly. In fact, the database readily available for the state of Wyoming has a vintage

22 Rural task Force White Paper No. 4. September 2000.

23 FCC Tenth Report and Order, CC Dockets No. 96-45 and 97-160, adopted October 21, 1999, (Inputs Order).

24 Currently Colorado uses another method of modeling costs known as the Hatfield or HAI model.

25 QSI acquired this data from the vendor, TNS.

date of 1998. QSI requested a price quote from the vendor for an update, and we were told that the update would likely cost "multiple tens of thousands" of dollars and a more formal project proposal – conditions to which we could not commit within the scope of this project.

One other issue with this database is that it is missing a number of wire centers. Specifically, all wire centers of *RT Communications* are missing, probably due to an oversight caused by the fact that this company reports to NECA together with another Wyoming carrier, *Range Telephone Cooperative*, under the same NECA ID number – an ID number used to identify carriers in the Synthesis Model.

Finally the model does not adequately treat exchanges that serve customers in two different states. For example, *Project Telephone* serves a small number of customers in Wyoming from a wire center located in Montana. Because the model assigns this company to Montana, we were unable to generate cost estimates for it.

Adjustments to the Model Inputs

Line Counts and Traffic Parameters

Line counts – the single most important determinant of per line cost in local telecommunications – and traffic parameters such as calling volumes, are the most obvious candidates for an update,[26] especially given an older vintage of the Wyoming customer location data. QSI requested from the Wyoming carriers the most recent data on line counts by wire center and customer type, and information on Dial Equipment Minutes and calls by jurisdiction. Not all the carriers provided the data, and some of the responses came with an insufficient level of detail. In such cases we used the companies'

[26] Similar updates are made annually by the FCC – see FCC Order and Order on Reconsideration in docket CC No. 96-45 released December 24, 2003.

loop counts reported to NECA,[27] and spread them by wire center and customer type using the original distribution of lines in the model database.

Similarly, for a number of companies QSI used a publicly available source of the Dial Equipment Minutes.[28] For several companies these data become unavailable after 2000 (the measure was "frozen" by NECA). In such cases QSI projected the minutes to the current study year[29] based on the company's line counts and assuming that the number of dial equipment minutes per line remained constant.

Outside Plant Inputs

We used a number of inputs filed with Qwest's 2004 Wyoming TSLRIC study[30] to update prices and other assumptions of the Model's distribution and feeder module – the block of the model that drives a majority of costs. QSI used the updated inputs to produce cost estimates not only for Qwest, but for all other carriers. Our rationale for such generalization was that Qwest's inputs either reflect market prices of the equipment (such as cable cost), or represent a more accurate representation of Wyoming-specific conditions than the default values of the model. In a number of cases where Qwest's Wyoming TSLRIC inputs did not provide the sufficient detail and where the inputs in questions were not expected to differ substantially across states, we utilized Qwest's most recent publicly available inputs to a TELRIC study filed in another state, Oregon.[31]

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27 The most recent data available are from 2003 NECA submission, which represents 2002. The data are available on the FCC web site.

28 Network usage reports available at the FCC web site.

29 The study year is 2003 for companies that provided the most recent line counts. For other companies the study year is 2002 because this year corresponds to the vintage of the most recent NECA loop counts available publicly.

30 Inputs are available publicly from the Wyoming Public Service Commission.

31 Information available to the public from Oregon PUC case UM1025, Qwest's Oregon Loop Module Default Values, September 8, 2003.

Using Qwest's inputs QSI updated the following inputs in the distribution and feeder module:[32]

a) Prices for copper and fiber cables, drop terminal, Feeder-Distribution Interface and DLC. QSI also made similar changes to the cable costs of the switching and interoffice modules of the model.
b) Structure sharing with other utilities.
c) Cable mix by type – aerial, buried and underground.

Expense Inputs

QSI changed the model default value of state income tax rate to zero. We also set depreciation lives to the WPSC approved lives.[33]

Fixed Wireless Cap

The Synthesis Model contains an inactive module[34] that places a cap on distribution investments by comparing them to the costs of the alternative technology – fixed wireless. Using the original formulas and wireless cap values of the source module, we recalculated distribution investments with the wireless cap.[35]

Cost Estimates

The model produces per line cost estimates by wire center and company. Because wire centers in the state differ significantly in size (which is a major cost driver due to scale economies), the resulting cost estimates exhibit wide variations. As expected, the lowest costs are observed in urban wire centers, and the highest – in remote locations with few

32 These updates tend to increase costs in high-cost wire centers.

33 Stipulation in US West docket No. 70000-TA-97-370.

34 Distribution module of the HAI model. The FCC did not use it when creating the Synthesis Model, but developed its own distribution routine. The wireless cap screen appears as one of the options of the Synthesis Model, but it does not affect the calculations.

35 These calculations are done in Excel. The cap is placed on the cluster-level data and as such, required recalculation of investment in the workfiles (cluster-level intermediate files). Formulas are mimicked after the HAI distribution module version 5.0a.

customers. On the company-wide level, per line cost averages tend to be higher than the corresponding levels of TSLRIC amounts.

It is important to keep in mind that the reliability of results varies by company. First, the Synthesis Model is known to produce more accurate results for large companies (Qwest in Wyoming). Second, as already mentioned, the single most important cost driver is the line count, information on which we attempted to collect from the companies. Not all companies from whom data was received provided line count data on a wire center level. At the same time, the "outlier" wire centers – wire centers with the highest costs – belong to the remaining companies, whose line count we were not able to verify. Therefore, the accuracy of cost estimates for the remaining companies could be improved if the wire center line counts for these companies become available.

In order to use the model cost estimates for the derivation of the cost-based fund, QSI first had to calculate costs *net of* federal support payments (just as the current mechanism accounts for federal support before determining the amounts of state support). We performed this task by using the company-level federal support data published in the WPSC's *2004 Annual Telecommunications Report*, and reducing the published amounts by the federal interstate access support (which is not related directly to the costs of local service).[36]

Statewide average cost as estimated by the Synthesis Model net of federal support is around $30 per line. This number is to be compared with the current statewide average price per line, which is $24.36.[37] Again, the comparison between these two numbers

[36] Federal interstate access support was estimated using the statewide data for total federal support and interstate access support from the Federal Universal Service Administrative Company 2003 Annual Report. We also reduced federal support for Range Telephone Cooperative because the federal data combine RT Communications with Range, and as we explained above, RT Communications is missing from the Synthesis Model. We estimated the amount of federal support for Range by using the individual line counts for Range and RT Communications published in the WPSC 2004 Annual Report.

[37] Current benchmark of $31.67 divided by 130%.

illustrates the general result that the Synthesis Model produces per line costs than tend to be higher than the TSLRIC or price-based approaches.

The Fund

As mentioned above, the Synthesis Model tends to produce higher per line cost estimates than the carriers' TSLRIC studies or the current prices. Not surprisingly, the total fund size (support) increases as we move from the current mechanism to the fund calculated from our cost model estimates.

For a meaningful comparison, QSI assumed that the cost benchmark would be equal to the current price benchmark ($31.67). QSI calculated the total amount of support per month (net of federal support), as well as the total number of lines supported using the same basic formula as the current fund – all costs in excess of the benchmark are to be supported.[38]

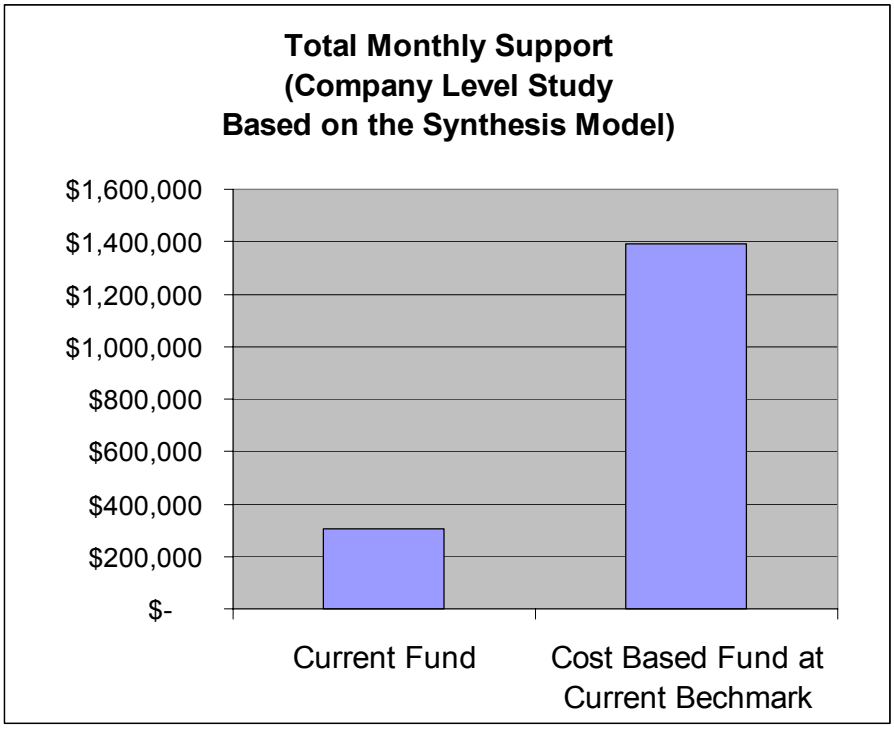
Finally, it was necessary for QSI to decide on the level of aggregation for the carrier's per line costs that are to be compared to the benchmark. The current fund uses zone level aggregation because retail prices in the state are set on the zone level, where there could be up to four zones within one wire center. Ideally, if the fund is portable (transferable to a competitive carrier), it should be distributed at the same level of aggregation as retail and UNE zones (to avoid the possibility of arbitrage from competitive entry). QSI did not have sufficient data to aggregate its cost estimates by retail/UNE price zone. Another alternative is to use company-level data. Under this approach the level of support would be based on the average company-level cost per line. (Distribution of the fund monies within the company territory might still be based on the relative costs of different areas/zones). A third approach is to use wire center level costs per line. The main difference of this approach from the company-level approach is that low-cost wire centers are not "helping" more expensive areas to level out the aggregate costs. Therefore, the

[38] This is different from the federal fund for non-rural carriers where only a portion of costs in excess of the benchmark are to be supported.

total size of the fund under the wire center approach would be higher (or at least, no less) than the fund under the company-level approach. The results for each alternative are presented below.

Company-Level Aggregation of Per Line Cost

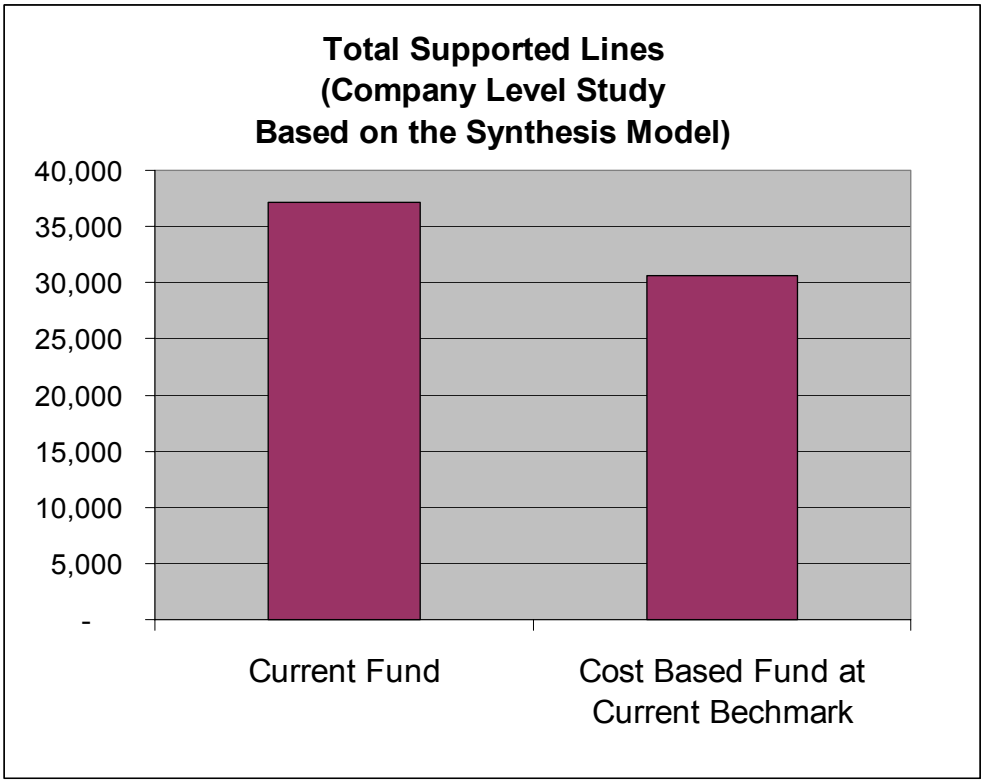
The following two charts compare the current fund – measured as the number of lines supported and the total amount of monthly support – to the fund calculated using company-wide per line cost estimates of the Synthesis Model.



As anticipated, the total dollar amount of support (under a mechanism that uses the model cost estimates) is higher than the current support (this happens because the model estimates costs at levels that are generally higher than the current prices. As the first chart demonstrates, the increase in the total support is drastic. The total number of carriers that receive support increased compared to the current fund, and all but one carrier would receive higher reimbursements, with one exception being Qwest (this

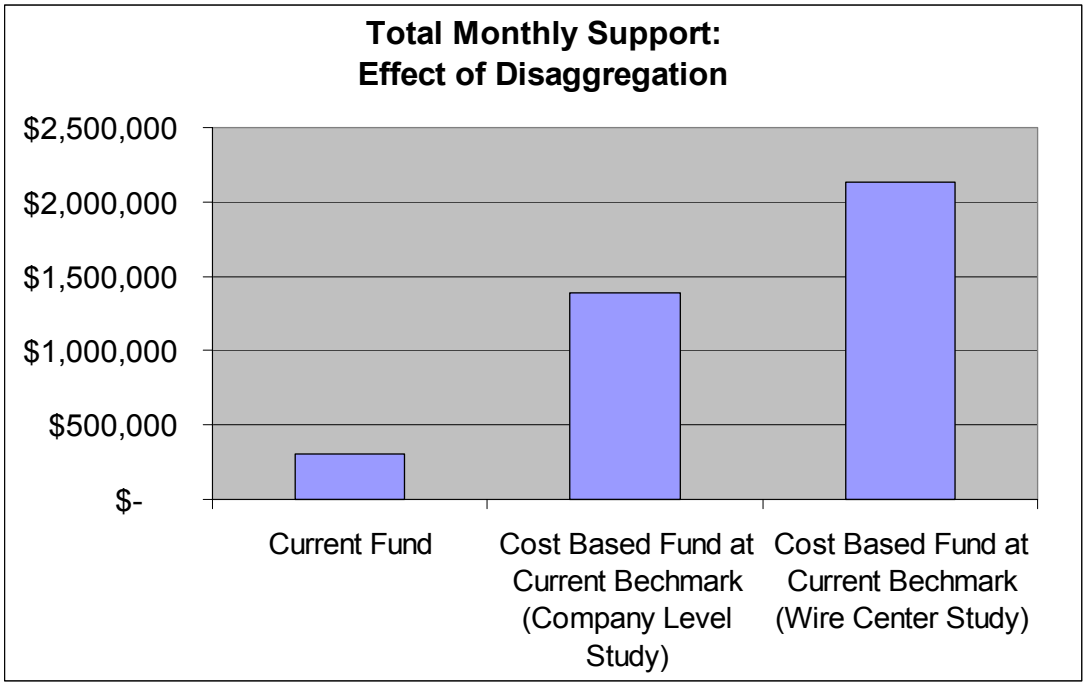
occurs because (as explained previously) under the company-level approach Qwest's high-cost wire centers would level out when averaged with its low-cost wire centers).

The effect on the total number of supported lines is just the opposite: under the company-level approach the total number of supported lines would decrease compared to the number of currently supported lines as illustrated below.

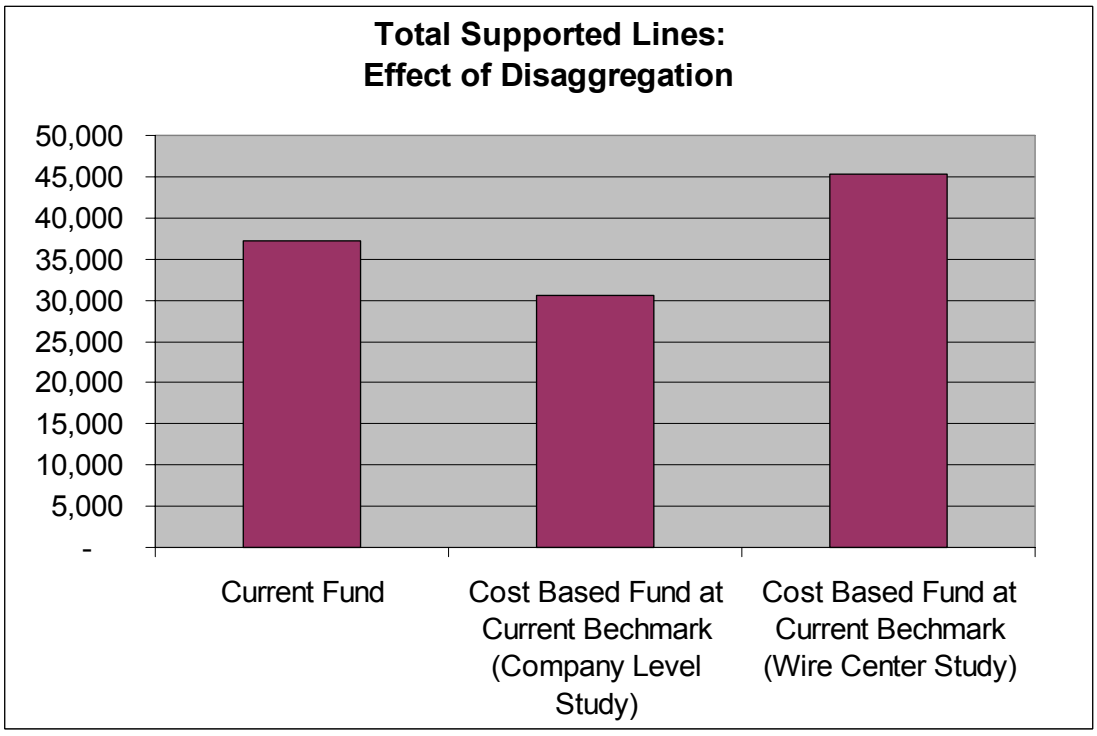


Wire-Center Disaggregation of Per Line Costs

As discussed above, if a wire center level costs per line is used to compare to the benchmark, the size of the fund increases even further as illustrated below.



At the same time, the total number of supported lines increases:



Under the wire center level approach all carriers would benefit from the new mechanism (their support would increase). Similar to the company-level approach, the distribution of fund support *among* carrier is different compared to the current mechanism: For example, companies that currently receive a large portion of the total fund would receive a smaller portion under the cost-based fund – this result holds even if we look at the independents only. This observation indicates that either the model does not estimate the costs accurately even on a relative basis (one company compared to another), and / or the current prices do not accurately reflect economic costs of one company relative to another. It can be concluded therefore, that various results could be expected should the WUSF mechanism be changed from price- to a cost-based. Clearly, the "winners and losers" resulting from such a change depend upon the approach that is used.

Fixed Wireless Cap

The fixed wireless cap did reduce per line cost estimates, but insignificantly – by 5% of a state wide basis. However, the reduction was more substantial in higher-cost wire centers. As a result, the effect on the total fund size was more pronounced – the total fund reduces by approximately 20% when the wireless cap was imposed. Still, a mechanism that is based on model estimates, even with the wireless cap, produces a drastic increase in the fund size compared to the current fund.

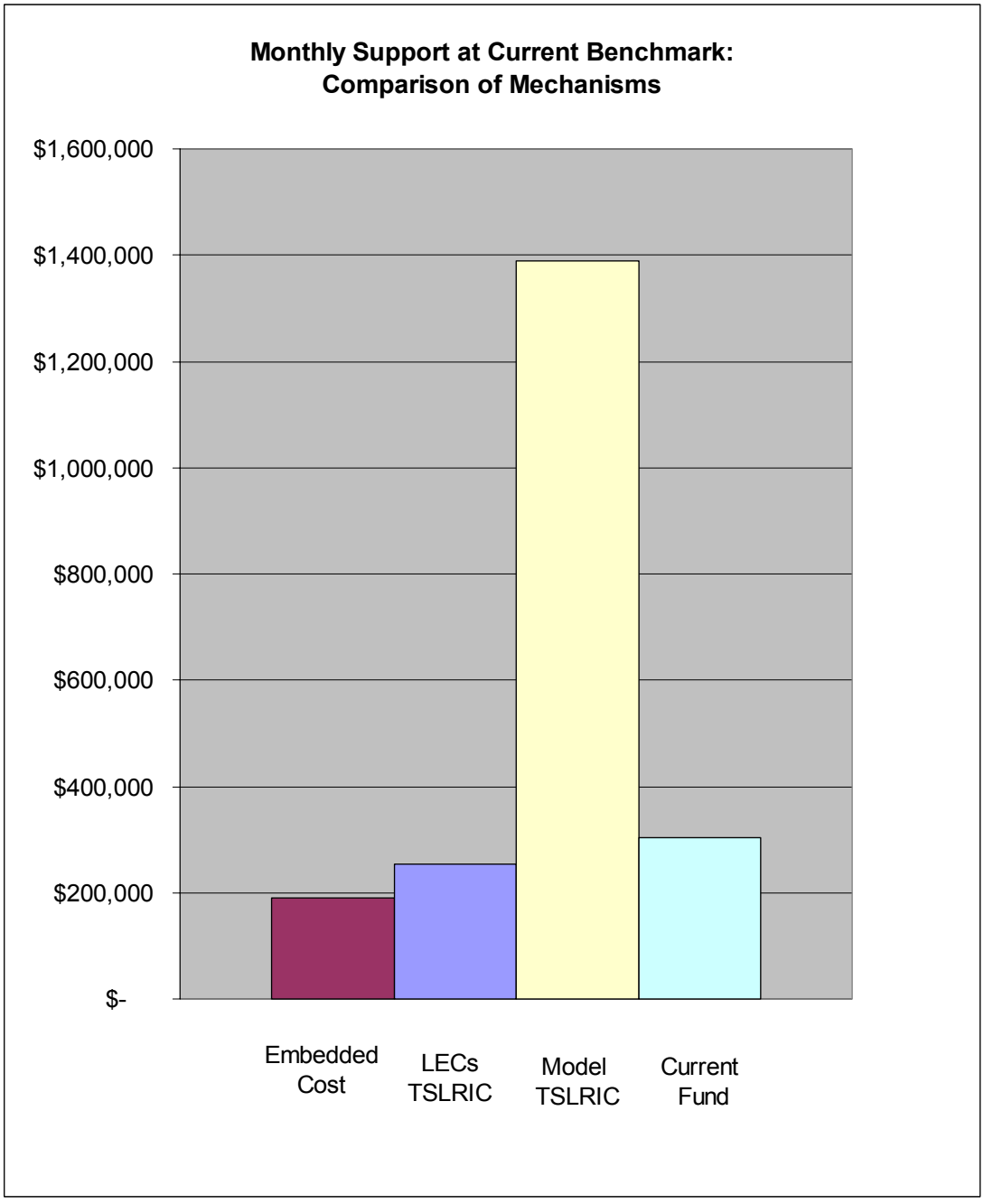
Fund Size Using Alternative Cost Estimates: Numerical Comparison

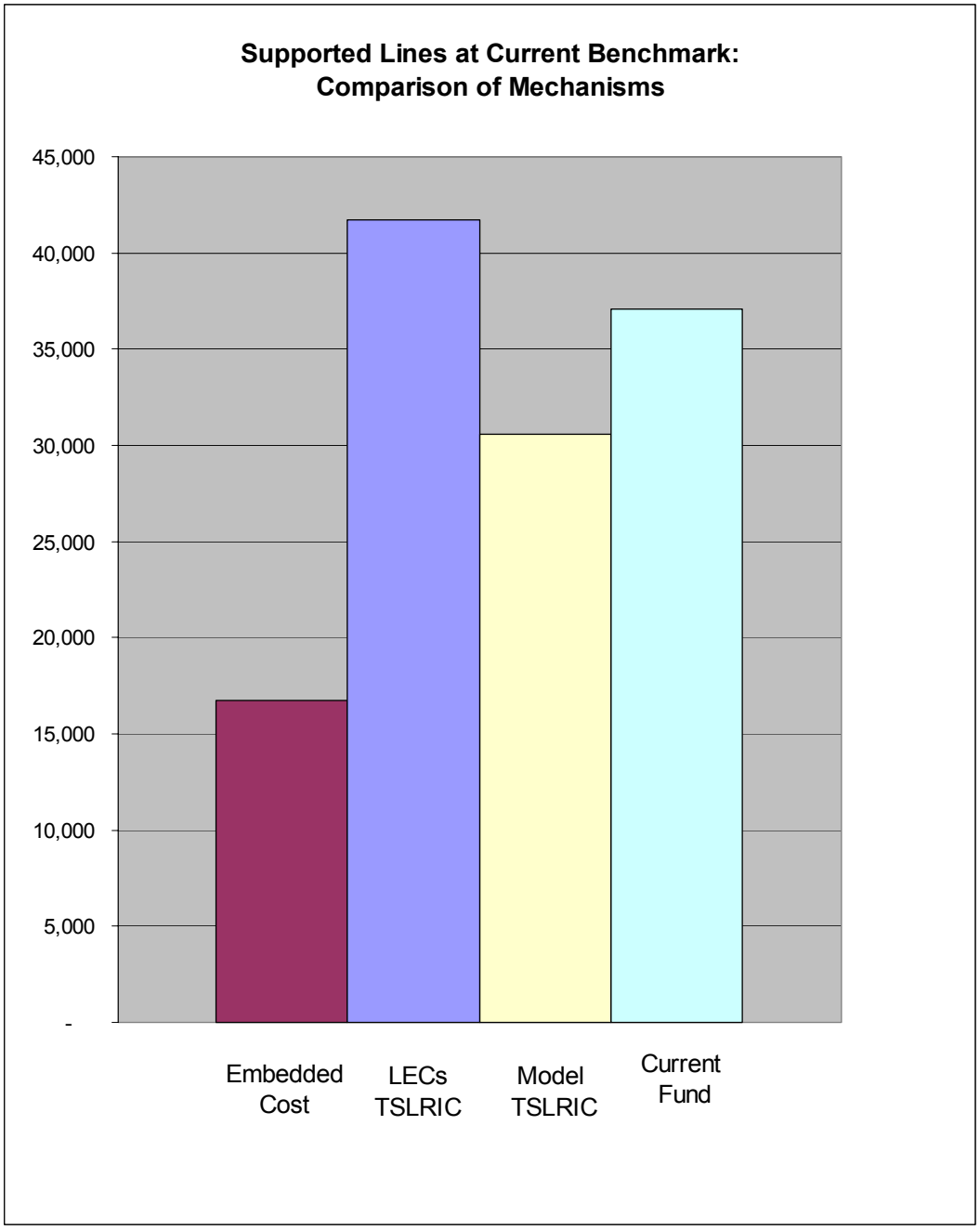
In this section we provide a numerical comparison of the fund sized using alternative cost estimates. Readers should be cautioned that this comparison is somewhat limited. Most importantly, because of the lack of the data all three cost approaches account only for *explicit* federal subsidies that are covering the cost of local services. Not accounted for under this approach are potential *implicit* subsidies coming from other services (such as intrastate access), as well as *other revenues associated with local service* (even if they do not contain any subsidies), such as calling features, DSL and reciprocal compensation.

Because the available data did not allow us to account for all revenue sources that contribute to local service, the main purpose of our numerical comparison (charts below) is to show that the three alternative costing approaches result in significantly different cost estimates, producing significantly different fund sizes. We do include in our charts the current fund size, but stress again that the current fund cannot be directly compared with the cost based funds *until* all revenues contributing to local service are subtracted from cost-based funds. Note that such adjustment would bring cost-based funds down.

Another factor that makes our comparison limited is that the available **embedded** costs exclude traffic-sensitive costs, and therefore, underestimate total embedded cost of local service. If the data on the embedded traffic-sensitive costs *were* available, the fund based on the embedded costs would likely be larger.

Charts below show the size of the fund and the number of lines supported under the alternative fund mechanisms. For comparison purposed the fund was sized using the current price benchmark and current amounts of federal explicit universal service support.


Monthly Support at Current Benchmark:
Comparison of Mechanisms
$1,600,000
$1,400,000
$1,200,000
$1,000,000
$800,000
$600,000
$400,000
$200,000
$-
Embedded Cost
LECs TSLRIC
Model TSLRIC
Current Fund



Analysis of Wireless Carriers

As noted previously in this Report, QSI received no response from wireless carriers with respect to its requests for information. Because wireless carriers are not subject to the regulation of the WPSC (and therefore, there is little publicly available cost information

regarding these carriers), and because wireless carriers did not provide information on which QSI could perform an analysis for this Report, QSI is unable to provide the Legislature with any data-driven information regarding the potential impact to the WUSF of wireless carriers receiving WUSF support. However, it is still possible to draw some general conclusion with respect to the impact of wireless carriers on the WUSF.

In 2001, the Legislature made it possible for wireless local service providers to become eligible for Wyoming Universal Service Fund support.[39] Eligibility for wireless carriers to receive support from the WUSF is subject to conditions set forth in W.S. § 37-15-502 (a) (i) – (iv). Additionally, the WPSC's rules dictate that wireless carriers must meet the same 130% support threshold as wireline carriers. According to the Manager of the WUSF, there are currently no wireless carriers in Wyoming receiving support from the WUSF. This is presumably due to these eligibility requirements. Should wireless carriers elect, in the future, to comply with these requirements in order to receive funding, or, should changes to the Statute be implemented which would make the eligibility requirements more appealing to wireless carriers, it is probable that the size of the fund would increase (as explained previously).

QSI recommends that prior to any changes to the Wyoming Statute or WPSC Rules being implemented, a full analysis be performed with respect to the potential impacts of supporting wireless carriers. QSI further recommends that any changes that are implemented in this regard be both competitively and technologically neutral.

Conclusions and Recommended Legislative Action

It is clear from the above analyses that the effects and impacts of changing from a price-based fund to a cost-based fund are heavily dependent upon not only the availability and quality of the data that is available for analysis, but also upon the methodology employed to estimate costs as well. QSI would therefore caution this Report's readers from

[39] W.S. § 37-15-502(a).

drawing any final conclusions regarding the effects of changing from a price- to a cost-based fund until (1) a complete and comparable (both carrier to carrier and vintage) set of data can be used in this analysis and (2) a determination can be made regarding the most appropriate methodology to be used for estimating costs. It is QSI's opinion that the WPSC is well suited for accomplishing both of these objectives, as the WPSC has authority to order carriers (wireline) to provide such data. Additionally, the WPSC can take comment and hold public hearings regarding the appropriateness of cost estimating methodologies to be used for establishing a cost-based fund.[40]

Although, based on our analysis, it is impossible – due to the data issues discussed above – to provide solid recommendations regarding whether a cost-based WUSF would be superior to a price-based WUSF, it is possible for QSI to offer general conclusions and recommendations regarding this issue. The analysis performed by QSI regarding the embedded cost mechanism revealed the chief and overriding weakness associated with relying upon a price-based mechanism – that a price-based mechanism may have no direct relationship to the cost of providing service. High cost universal service mechanisms such as the WUSF are, by definition, designed to provide assistance to consumers who are located in areas in which the cost to provide telecommunications service is exceptionally high. When price is used as the basis for providing such funding and assistance to consumers, the relationship between cost and the need for support can become blurred. This blurring of this critical relationship can be illustrated by examining Table 2, in which it is clear that prices charged by carriers, when compared to (embedded) costs of service is clearly inconsistent in Wyoming. When there is a disconnect between price and cost, and when the funding mechanism is price-based, it may create an incentive for carriers to set, or propose to the WPSC, rates that are sufficiently high to ensure that the funding trigger is met. This perverse incentive (to increase retail rates without regard to cost) is compounded in an environment in which

[40] Considering the proceedings at the federal level which are considering appropriate cost estimates for rural, high cost carriers. (As discussed above, these proceedings are currently ongoing at the federal level).

competitive market disciplines are absent (as is the case in much of Wyoming). Setting the fund mechanism to a cost-basis would not only eliminate this price / cost disconnect, but it would remove these incentives. Additionally, competitive providers would, appropriately, compete for consumers (and WUSF funding) based upon costs, providing all carriers with the incentive to operate in as efficient and low-cost manner as possible.

In summary, therefore, although, because of the data limitations discussed previously, it is not possible to predict the impact (in terms of dollars) of changing to a cost-based fund, conceptually, such a change has merit. Therefore, QSI recommends that the Legislature consider directing the WPSC to open an investigatory Docket that would address these issues, and implement changes to the WUSF that are consistent with the Legislature's policy objectives.

SINGLE VERSUS MULTIPLE LINE FUNDING

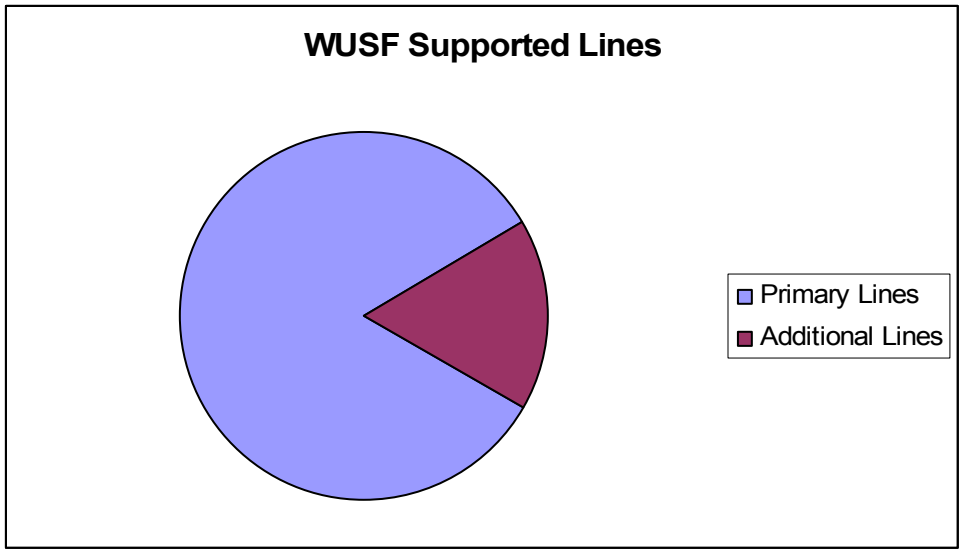
The second objective of the study funded by the Wyoming Legislature is to examine the implications and desirability of supporting only a single line for each business and residential customer receiving support through the fund. QSI met this objective by providing the Wyoming Legislature with the "*implications"* and "consequences" of funding only a single line. While below, QSI has provided the Legislature with high level observations regarding the pros and cons associate with this issue, QSI has abstained from providing comment regarding the "*desirability*" of such an action, since that judgment is best made by policy makers such as the WPSC or the Wyoming Legislature. By providing the associated implications of funding single lines only, decision makers may reach their own conclusions relative to the desirability of changing the current support structure.

METHODOLOGY

In order to perform an analysis that can be utilized to provide the implications of funding a single, rather than in some cases, multiple customer connections using WUSF resources, it was necessary to request relevant information from each of the Wyoming carriers that currently receive support from the WUSF. Once this data was gathered and company-specific information was aggregated, it was possible for QSI to determine an approximation of the number of non-primary residential and multiple business lines currently benefiting from WUSF support in Wyoming. Using this methodology, QSI determined that roughly 17% of the total lines receiving support from the WUSF can be categorized as "additional" lines as illustrated by the graph below. [41] Using this information, QSI calculated the approximate number of lines in Wyoming that can be categorized as "additional" lines receiving WUSF support. According to the Manager of

[41] According to the May, 2004 Report of the Federal Communication Commission's Industry Analysis and Technology Division of the Wireline Competition Bureau, the percentage of additional lines for households with telephone service increased dramatically, from about 3% in 1988 to about 26% in 2000, and has since dropped to around 18% in 2002.

the WUSF, the total number of lines receiving support from the fund for the fiscal year beginning July 1, 2004 is 37,153. Therefore, the approximate number of "additional" lines receiving support from the WUSF is 6,316.



This figure is an approximation since carriers do not specifically track additional lines. Consequently, some carriers provided QSI with approximations based on address, (if there was more than one phone number at one address, the additional numbers were assumed to be additional lines). Secondly, several carriers reported to QSI that they do not distinguish between first and additional lines. In short, certain carriers have adopted an a "line is a line" approach, regardless of whether it is used as a primary or secondary line. Because all lines are treated by these carriers as primary lines, to the extent that such carriers have customers with additional lines, those lines are not represented by our additional line percentage. This "gap" in the data could be rectified through the issuance of an Order by the WPSC which would require carriers to track and account for these lines. Such an accounting by carriers would improve the accuracy and validity of this analysis, but it may create additional administrative and logistical problems as will be discussed below.

ANALYSIS

As noted above, QSI is not advocating a policy change to the Wyoming Legislature regarding the support of single line connections versus multiple line connections. In the context of this Report, QSI is presenting to the Wyoming Legislature as complete a set of information as possible at this time in order for decision-makers to determine an appropriate policy for Wyoming telecommunications customers. To that end, QSI presents, in the following sections, the amount of WUSF support required for funding only a single line, as well as the support required for continuing the current practice of funding multiple lines at each premise.

Support for Funding Only a Single Line

Wyoming Law May Require Single Line Funding Only

The WPSC administers the WUSF in accordance with the Wyoming Act.[42] The Wyoming Act specifies that the WUSF is intended to assist only those customers of telecommunications companies located in areas of the state with relatively high rates for *essential* services. The Wyoming Act defines "Essential telecommunications service" to mean a customer's access to service that is necessary for the origination or termination, or both, of two-way, switched telecommunications for both residential and business service within a local exchange area."[43] Based upon this language, the Wyoming Act can be interpreted to have the intent of providing universal service support only to customers in relatively high cost areas, and only to provide those customers access to the Public Switched Telephone Network ("PSTN") for purposes of "universal service". Universal Service is defined in the Wyoming Act as "the general availability of essential telecommunications service at an affordable and reasonable price."[44] From the definitions contained within the Wyoming Act, it can also be argued that once these conditions are met (i.e., a customer is connected to the PSTN), the intent of the WUSF

42 W.S. § 37-15-101

43 W.S. § 37-15-103 (iv).

44 W.S. § 37-15-103(xiv).

has been fulfilled, and that supporting multiple connections is not necessary to support or advance universal service. It would appear, therefore, that for customers with multiple lines, the intent of the Wyoming Act is accomplished when the customer has connectivity to the PSTN through his or her primary line. It can further be argued that once that primary line connectivity has been established, (thereby fulfilling the goals of the Wyoming Act by providing access to the PSTN) further WUSF assistance is not required. More specifically, it could be argued that funding more than a single line is not permitted under current Wyoming law. This holds true for either residential or business customers. In sum, strong arguments can be made that (although the Wyoming Act does not specify that only primary lines are eligible for receiving WUSF support) the intent of the Wyoming Act is fully fulfilled by supporting primary lines only, and that funding multiple lines goes beyond what the Wyoming Act intended.[45]

It is possible to shed further light on this issue by examining related past and ongoing activities outside of Wyoming. At the federal level, the Telecommunications Act of 1996 ("Federal Act") directed the Federal Communications Commission ("FCC") to institute a Federal-State Joint Board[46] ("Joint Board") to among other things recommend changes to any of the FCC's regulations with respect to defining the services to be supported under the federal universal service support mechanism.[47] Since its formation in 1996, the Joint Board has consistently recommended that federal universal service support be limited to single connections to subscribers' primary residences, and that providing support for second connections is not consistent with the goals of universal service. The most recent of these recommendations from the Joint Board came earlier this year.[48] The Joint Board

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45 It should be noted that in February of 2000, the Wyoming Public Service Commission interpreted the Wyoming Act to be that multiple lines are supported. See Docket No. 90072-XO-99-9.

46 The Joint Board is comprised of State Public Utilities Commissioners and their Staffs, State Consumer Advocates and their Staffs, and Federal Communications Commission Commissioners and their Staffs.

47 Telecommunications Act of 1996. §254(a)(1)

48 Federal-State Joint Board on Universal Service, Recommended Decision, CC Docket No. 96-45, 19 FCC Rcd 4257 (2004). It should be noted that at paragraph 66, the Joint Board concedes that Section 254(f) of the Telecommunications Act of 1996 makes it clear that states "may adopt regulations not inconsistent with the [FCC's] rules to preserve and advance universal service" and that states may

has based its past recommendation on arguments similar to those discussed above with respect to the Wyoming Act, (i.e., providing support for a single connection provides "access" to eligible services and that providing support for additional lines is not required in order to achieve the goals of universal service).[49]

In summary, arguments can be made that the goals of universal service are achieved by supporting a single connection to the PSTN. More specifically, it can be argued that funding a single connection is adequate for achieving the goals of the Wyoming Telecommunications Act, and that funding multiple lines would be inconsistent with the Wyoming Act.

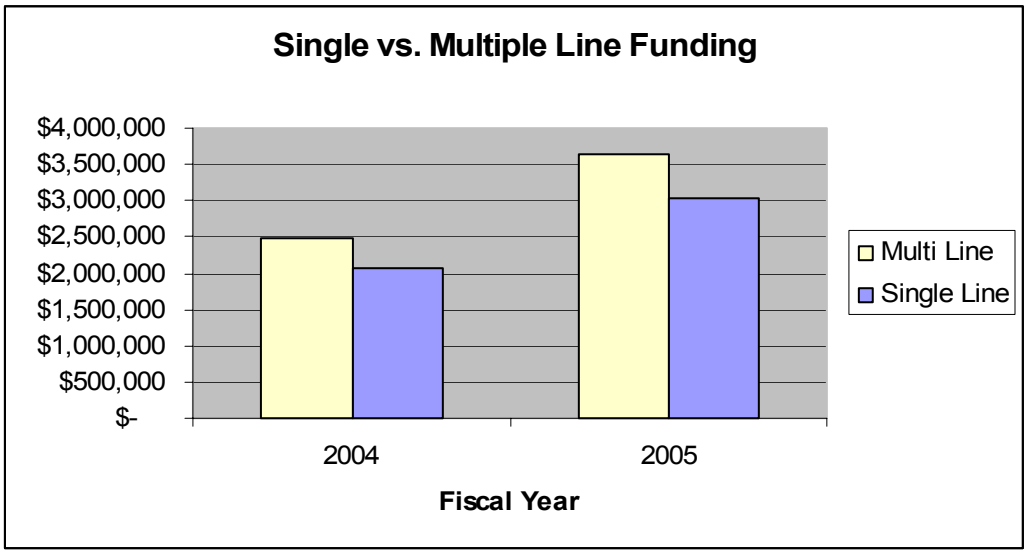
Funding Additional Lines Burdens the WUSF and Wyoming Consumers

In addition to the Joint Board's arguments that "access" to the PSTN can be achieved through a single connection, thereby making support for multiple connections superfluous, the Joint Board raises another argument against continuing support for multiple connections that is a relevant consideration for Wyoming policy makers: supporting multiple connections may impact the sustainability of the WUSF by making the size of the WUSF excessive.[50] If additional lines were not supported, based on the approximation that currently 17% of customer connections in Wyoming that receive support from the WUSF are additional lines, the WUSF's size would likely be reduced proportionately. According to the Manager of the Wyoming Universal Service Fund, in order to provide support to eligible lines in Wyoming, the size of the fund was $2,489,262 for FY 2004, and is $3,644,436 for FY 2005. If additional lines were not eligible for funding, the size of the fund could be reduced by 17% or approximately $423,175 for FY 2004 and $619,544 for FY 2005 as illustrated below.

"provide for additional definitions and standards" so long as those supplements do not rely on or burden the federal support mechanisms.

49 Federal-State Joint Board on Universal Service, Recommended Decision, CC Docket No. 96-45, 19 FCC Rcd 4257 (2004) at paragraph 58.

50 Federal-State Joint Board on Universal Service, Recommended Decision, CC Docket No. 96-45, 19 FCC Rcd 4257 (2004) at paragraph 67 – 68.



According to WPSC rules, the Commission is to issue an Order, annually, stating, based upon the recommendation of the WUSF Manager, the WUSF level of assessment that shall be applicable for the twelve-month period beginning July 1st of each year. [51] The WUSF Manager bases this recommendation to the Commission in large part on the computed amounts needed for payment to telecommunications companies in order to provide assistance to Wyoming customers whose rates would exceed the WPSC calculated benchmark.[52] The WUSF assessment is levied on all telecommunications companies in Wyoming that realize intrastate revenue from operations in the state.[53] Since the carriers pass this assessment on to their customers through a surcharge on their bills (Public Service Commission rules require that the assessment appear as a separate line item on each customer's bill unless a waiver is granted by the Commission) it stands to reason that there is a direct relationship between the size of the assessment, and monthly phone bills of Wyoming telecommunications customers. (For example, a Wyoming customer with a $50 phone bill would be assessed $0.50 if the assessment is

51 PSC Rules, Chapter V, §500(l).

52 PSC Rules, Chapter V, §500(k).

53 This includes wireless carriers.

1%, $1 if the assessment is 2%, and so on.) Because the size of the assessment is directly tied to the number of lines supported by the WUSF, supporting multiple as opposed to single connections results in higher monthly phone bills for Wyoming consumers. Since all Wyoming customers are burdened with supporting the WUSF, and because (as discussed above) it can be argued that the funding of multiple lines is unnecessary, continuing the practice of supporting multiple lines in high cost areas of the State (and the resulting higher monthly rates to Wyoming consumers who must contribute to the WUSF) may detract from the goals of universal service by actually (and unnecessarily) pricing currently marginal customers out of the market.

Restricting the number of lines supported by the WUSF would reduce the WUSF assessment required to fully fund the WUSF. The obvious benefit of making such a change is that by supporting fewer lines, the Legislative goals are still achieved but the size of the WUSF and the associated burden on Wyoming consumers who contribute to the WUSF could be reduced. Since Wyoming consumers pay a monthly assessment in order to fund the WUSF, the impact of funding single connections only would have the direct result of reducing the monthly telephone bills of all Wyoming consumers. Because the assessment to each customer varies based on the amount of each customer's monthly phone bill, it is not possible to illustrate exactly how much each customer's monthly bill would be reduced. However, using as an example a Wyoming customer who pays a monthly phone bill of $50 per month, and is subject to a 1% WUSF assessment, that customer would be required to pay $0.50 in order to support universal service in Wyoming. In fiscal year 2004, the assessment rate was set by the Public Service Commission at 1%. At that rate, the WUSF assessment generated $2,725,533 in revenues to be used to provide universal service support. As noted above, funding single rather than multiple connections would have resulted in a savings to the WUSF of $423,175 and would therefore reduce the assessments needed to provide support. Because of the reduced need for funding, it would have been possible for the Public Service Commission to reduce the assessment level accordingly (by approximately 16%) in FY 2004 to reflect the fact that fewer lines were receiving support. Hence, the

assessment to the Wyoming customer could have been 0.84% of his or her monthly phone bill rather than 1%, resulting in a monthly phone bill reduction from $0.50 to $0.42, or an $0.08 reduction as illustrated in the table below.

Table 3

	WUSF Funds Multiple Lines	WUSF Funds Single Lines
Assessment	1%	0.84%
Monthly Payment (Based on $50 Phone Bill)	50¢	42¢
Monthly Bill Reduction	8¢	

While these per-customer decreases may appear to be insignificant in this example, there is no doubt that the practice of funding multiple, as opposed to single connections would tend to increase the size of the WUSF (by over $400,000 in this example), and would increase the burden on Wyoming telecommunications consumers.

Alternatively, the Legislature could restrict universal service support to single lines while keeping total WUSF support at the same level used to fund multiple lines. This would allow the WUSF to support a greater number of single lines. If the Legislature wanted to expand the number of primary residential and single business lines that receive support in high cost areas of Wyoming, it could lower the benchmark factor from 130% to some lower percentage. This would lower the threshold that a customer's local exchange service rate would have to surpass to be eligible for WUSF credit.

Support for Funding Multiple Lines

Customers Currently Receiving Support Would Be Impacted

Although there are identifiable benefits associated with limiting WUSF support to the funding of primary lines, there are also significant concerns that must be considered that may result from the implementation of such a policy. The most obvious of these concerns is that rates for additional lines would increase for Wyoming consumers who currently receive funding from the WUSF for such connections. These rate increases are, on a per customer basis, much more significant than the monthly bill reductions which would result from implementing such a change.

Table 4[54]

Carrier / Exchange	Additional Line Rate with WUSF Funding	Additional Line Rate without WUSF Funding	Additional Line Rate Without WUSF Funding
All West	$ 31.67	$ 53.73	$ 22.06
Chugwater Telephone	$ 31.67	$ 36.64	$ 4.97
Qwest Corporation	$ 31.67	$ 41.35	$ 9.68
Union Telephone			
Base Area	$ 31.67	$ 35.63	$ 3.96
Farthest from Base	$ 31.67	$ 93.96	$ 62.29
Sprint / United			
LaGrange	$ 31.67	$ 73.43	$ 41.76
Lingle	$ 31.67	$ 64.30	$ 32.63
VP Telecom	$ 31.67	$ 51.12	$ 19.45

As illustrated in Table 3 above, if a policy was implemented making additional lines ineligible for WUSF support the impact on customers receiving that support would be significant. This is because as of July 1, 2004, WUSF funding is used to ensure that no customer pays more than $31.67 for phone service (regardless of whether the service is to the primary or an additional line). Should additional lines become ineligible to receive this support, some customers would be faced with significant increases in rates for

[54] Source: Wyoming Universal Service Fund Manager

additional lines. As illustrated above, customer bills for additional lines could increase anywhere from $4.97 to $62.29 per month, representing rate increases as high as 197%.

Economic Development Could Suffer

Because additional lines are often used not only as second voice lines, but as data and / or fax lines, economic development in rural areas may be impacted if WUSF funding ceases to be available to fund such connections. In the absence of funding for additional lines, consumers would be required to pay the full cost of additional lines without any offsetting WUSF support.[55] This could make rates for additional lines unaffordable and could potentially be a blow to economic development in the impacted community. For example, for business customers – who frequently have more than one line – the total costs for telephone service could increase dramatically absent continued funding. As the Legislature is aware, in rural areas, telecommunications services are critical to connectivity with urban areas and potential customers in those areas. One likely response of business owners faced with these increased costs would be to recover those higher costs by increasing the prices for their particular products or services. Another likely result, assuming competition doesn't allow a price increase, is reduced profits for rural companies. In this way, the decreased funding may impact the entire local economy, in that the cost of products and services in that community would increase, or companies' profits would be reduced impacting their ability to expand services or offerings. Additionally, rural communities may be less attractive to "telecommuters" if the cost of second and / or data lines is excessive, thereby adversely impacting community growth. Such a result would not only adversely impact a community's tax base, but would also likely impact small business investment opportunities for small rural communities in Wyoming that are in desperate need of economic development.

Funding Single Lines Could Undermine Universal Service Goals

[55] It should be noted that with the advent of digital subscriber line ("DSL") technologies copper loops can be used to transmit both voice and high speed data. Unfortunately, DSL technologies are subject to distance limitations that may result in many outlying rural customers not being eligible to subscribe to such services.

Limiting funding to primary connections could have the unintended and even perverse effect of actually undermining the goals of universal service in Wyoming. Under the current funding mechanism, in which all lines are eligible for universal service support, there is a common perception by many (including local exchange carriers who benefit from the support) that WUSF funding goes toward funding high cost rural telephone *networks*, as opposed to funding individual high cost connections to the network. After all, telecommunications consumers are served, not only by their individual lines to the PSTN, but by the network itself inclusive of the line connections. The telecommunications industry is appropriately noted for rapidly changing and advancing technologies. Carriers should continually invest in their networks in order to take advantage of these technologies and in order to provide customers with the lowest cost, highest quality services. If the historical practice of supporting the network is replaced by supporting single lines only, (which may create uncertainty over sufficient funding from the WUSF) the incentive for carriers to invest in new and often costly network technologies may be reduced. Following this line of thought to its logical conclusion, in a joint response to the Joint Board's recommendation to fund single connections (discussed previously), a group of state public utility commissioners warned that such a limitation on universal service funding may jeopardize the continued existence of "carriers of last resort." In their comments, these state commissioners reasoned that it would not be reasonable to expect carriers to maintain the responsibility of being carriers of last resort if the funding necessary to build and maintain their networks is denied them.[56]

Administrative Issues

Finally, carriers have historically resisted the notion of supporting only single lines because such an action would create significant administrative and logistical problems. These problems stem from customers essentially "gaming the system", by developing

[56] Joint Separate Statement of Commissioners Jonathan S. Adelstein, G. Nanette Thompson, Regulatory Commission of Alaska, and Bob Rowe, Montana Public Service Commission Approving in part, Dissenting in Part. FCC 04J-1, Page 5.

clever ways of having more than one account (possible even with separate carriers) so that each account would be considered the primary line in order to continue to receive support for additional lines. The Washington Utilities and Transportation Commission ("WUTC"), when considering this issue received comments from multiple parties to the effect that continued support for multiple lines would avoid many administrative costs. The WUTC cited its own experience with respect to the difficulties of administering restrictions on multiple lines, concluding that "customers would spend their time and energy avoiding the restriction and carriers would be placed in the position of attempting to police their customers."[57] In addition, some carriers argue that limiting the scope of support to single connections would require the development of complex new rules to define "primary" lines, would require tracking of those lines, and would intrude on consumer privacy. This issue is of significant concern, and, in fact, with respect to this very issue, it should also be noted that the Joint Board in recommending that multiple connections should not be eligible for receiving universal service support *makes its recommendation conditional* on the FCC's ability to develop rules and procedures that do not create undue administrative burdens.[58]

Conclusion

It is clear that there are strong arguments for utilizing WUSF funding to support only a single line, as well as strong arguments for continuing the current practice of providing funding for multiple lines at a single premise. As noted previously, the ultimate determination regarding the *desirability* of whether to continue current practices or to limit future funding is a policy decision to be made by the Wyoming Public Service Commission and / or the Wyoming Legislature and is dependent upon whether the Legislature's policy objectives are more strongly aligned with the concept of ensuring that telecommunications service should be affordable for all Wyoming consumers, or

[57] Promoting Competition and Reforming Universal Service, A Report to the Washington State Legislature, November, 1998. Page 46.

[58] Federal-State Joint Board on Universal Service, Recommended Decision, CC Docket No. 96-45, 19 FCC Rcd 4257 (2004) at paragraph 81.

more strongly aligned with the concept that minimizing the size of the WUSF provides benefits to the state. From a theoretical standpoint, funding additional lines in Wyoming only exacerbates the problems associated with subsidies. Therefore, from a theoretical standpoint, it would appear to make sense to curtail the practice of funding additional lines in the state. However, when the issue is addressed from a more practical standpoint, it would appear that most contributing consumers would experience very little positive impact from making such a change. Additionally, remedies to the administrative issues of tracking primary lines would likely be expensive, if achievable, and therefore, potentially very costly to carriers. Since carriers would certainly pass these additional costs on to ratepayers, the consumer impact of funding single rather than multiple lines could very well be negative to all consumers (not just the consumers that previously benefited from the practice).

As changes to this funding criteria are considered decision makers should be mindful that the Federal Communications Commission is also currently reviewing this issue as it relates to universal service support and is considering whether or not supporting additional lines is appropriate. Should the FCC determine that such support is not appropriate at the federal level, the negative impacts of not supporting multiple lines discussed in the previous section would be compounded (perhaps by orders of magnitude). While it may be premature to reach any conclusions regarding how this issue will ultimately be resolved by the FCC, it should be noted that on Wednesday, September 15, 2004, the Senate Appropriations Committee added language to the Commerce, Justice and State Appropriations bill that would block the FCC from implementing the Universal Service Fund's Joint Board recommendation on primary-line restrictions (the practice of funding multiple lines would be continued).

Given the pros and cons of this issue, and given the fact that currently, carriers lack the ability to efficiently and accurately track primary lines, it would appear to make sense to maintain the status quo. Although the concept of providing only the funding necessary for customers to have access to telecommunications services (through a single line) is

conceptually appealing, from a practical perspective, such a requirement may result in higher – not lower – rates for currently contributing customers. Should technology develop which would allow carriers to efficiently and at low cost, track primary lines, QSI believes that the Wyoming Public Service Commission should re-address this issue, and consider funding single lines only.

POTENTIAL IMPACTS OF NEW TECHNOLOGIES ON THE WUSF

In addition to the study requirements set forth in the RFP, QSI also agreed to provide the Legislature with analysis and information regarding the impact of newer, but currently available lower cost technologies on the WUSF. As discussed below, these newer technologies hold promise in that their potential cost savings in high cost rural areas of the state may significantly lessen or even eliminate the need for the WUSF in the future.

New Technologies

The last few years have seen an explosion of new technologies used to augment, compliment or replace traditional telecommunications services. Some of these new technologies are considered "intermodal" competition for traditional landline or wireline basic local services. Perhaps the most discussed new technology is wireless. Clearly, wireless usage has grown dramatically over the last few years, especially when one considers the many forms of wireless offerings. In Wyoming, wireless growth has been dramatic as well. For instance, in December of 1999 there were 127,634 mobile wireless subscribers but that amount more than doubled to 276,344 lines as of June of 2003.[59] The growth in wireless can be attributed to increased quality of service, expanded calling areas, better pricing and calling packages and new features. As the Legislature is aware, the number of wireless lines (276,344 as of June 2003) is almost equal to the number of basic local wirelines (304,439 as of January 1, 2003) provided by the local telephone companies.[60] This is not to say, however, that wireless is supplanting basic local services. While a small percentage of the population is substituting wireless for the local phone at home, most people prefer to have both wireless and wireline if they can afford to do so, and therefore, the two technologies compliment one another.

[59] See FCC Study on Telephone Trends, Released May 6, 2004, at Table 11.2.

[60] Id. at Table 7.2. As of December 31, 2002, there were 304,439 lines in Wyoming.

Other "wireless" types of technology include: Wi-Fi, Bluetooth, WiMAX, Mobile-Fi and UltraWideband. Wi-Fi is a fixed wireless technology used to create "hot spots" for computer users. For instance, a person may sit in an eatery (such as StarBucks) or an airport terminal with his or her Wi-Fi capable laptop and enjoy Internet access from a nearby antenna for free or for a fee. Wi-Fi is high-speed wireless technology that connects PCs, printers, and other devices over short distances (100 feet or so) and links them to the Internet. Wi-Fi is now the dominant technology in wireless home networking. This technology allows individuals to have wireless networks in their homes for multiple computers, printers and other office equipment. Bluetooth is a similar wireless technology that operates over radio waves.

WiMAX is new form of high-speed wireless networking that is similar to Wi-Fi but can reach up to 30 miles. This technology is limited and cannot be used in moving vehicles. A new standard, referred to as Mobile-Fi, will be available in two to three years and will make WiMAX Internet speeds (faster than what people get today at home with their broadband connections) in cars, trains and other moving objects.

Ultrawideband or UWB lets people move massive files quickly over short distances (ten to twenty meters). This technology was born in the U.S. military. In a home, for instance, you will be able to use ultrawideband to move huge data files – such as movies – from a computer to a television without wires between the two devices. You could also use UWB to swap data between your digital camcorder and desktop computer. Or you could send signals from your digital cable box to portable flat panels displays scattered throughout your house. The promise of this new technology is that it is five to ten times faster than Wi-Fi.

Cable, with its established rights-of-way and cable to the home is emerging as a strong alternative to wireless and traditional wireline services. Cable companies spent an estimated $75 billion in recent years updating their infrastructure to offer customers

discounted bundled packages of local voice, high-speed Internet connections and video.[61] Not only are these cable networks competing for the traditional telephone company digital subscriber line or DSL (broadband) services, and supplanting – at least in part -- the dial-up Internet access services, they are also competing for basic local service.

Another new technology that benefits from existing rights-of-way is broadband over power lines or BPL. BPL offers high-speed access to your home through an unlikely path – a common electrical outlet. With BPL you can plug your computer into any electrical outlet in your home and have access to high-speed Internet. Like phone companies, power companies have access to homes all over the world. In fact, power companies have more ubiquitous access to homes than telephone companies. This makes power lines an obvious vehicle to providing Internet to places where fiber optics have not yet been deployed. In short, the infrastructure required to provide this technology already exists throughout Wyoming, including rural areas of the state.

The one thing these new wireless and cable networks offer in common is an alternative to the public switched telephone network. Indeed, many if not most of these technologies can be used to provide voice over Internet protocol or VoIP.

Internet protocol ("IP") technology treats services like voice as an Internet application in the same manner as it treats voicemail, video, or viewing a web page or any other application. The universe of IP-based or IP-Enabled services that include a voice capability are frequently referred to using the acronym of VoIP. VoIP technology allows voice communications to travel over the same network that carries Internet traffic and permits the voice communications to become integrated with numerous other capabilities and functionalities. Because voice data packets can be dispersed between other e-mail and web page traffic on the Internet, the process doesn't use as much bandwidth and makes phone calls essentially as cheap to transmit as e-mail.62 Indeed, VoIP is a good

61 Fortune Magazine, May 31, 2004; page 124.

62 See Comments of VON Coalition in CC Docket No. 01-92, WC Dockets No. 02-361, 03-211, 03-266, 04-36; filed August 19, 2004, at page 2.

example of the convergence of computers, telephones and television into a single and more efficient integrated information environment.

In the simplest of terms, VoIP is an information service application that uses the Internet backbone and discrete data packets to deliver real-time voice communications. Rather than voice information being transmitted across the traditional circuits of the public switched telephone network, VoIP calls are made using Internet protocol, and the Internet backbone, or some other private IP network. This transmission of discrete data packets over the Internet rather than the transmission of normal analog or digital signals over the public switched telephone network is one difference between VoIP and telecommunications services, but focusing on this difference in transmission would be an over simplification. It should be noted, however, that there is no single or standard VoIP service. VoIP calling, being IP-enabled, facilitates the introduction and integration all sorts of potential capabilities not present with PSTN circuit switched calls.[63] From a regulatory perspective the IP-based capabilities distinguish VoIP – an information service -- from basic telecommunications services. These service offerings are growing rapidly, because, among other things, they have remained lightly regulated.

FCC Chairman Powell maintained this support for leaving IP-Enabled services unregulated at the FCC Forum on Voice over Internet Protocol in Washington, where he was quoted as saying, "As one who believes unflinchingly in maintaining an Internet free from government regulation, I believe that IP-based services such as VoIP should evolve in a regulation-free zone". Chairman Powell went on to caution regulators with respect to IP-Enabled services' regulation, saying "No regulator, either federal or state, should tread into this area without an absolutely compelling justification for doing so."[64]

[63] For instance, when you have a missed call on the Vonage service, you get an email detailing the call information (time, calling number, etc.). The features and capabilities of VoIP services are many and expanding.

[64] Opening Remarks of FCC Chairman Michael K. Powell at the FCC Forum on Voice over Internet Protocol (VoIP) December 1, 2003 – Washington, D.C.

Chairman Powell's statements were part of a daylong forum to address business, technical, service feature and policy issues. More recently, Chairman Powell stated,

> "The burden should be placed squarely on government to demonstrate why regulation is needed, rather than on innovators to explain why it is not."[65]

By refraining from regulating technology, the FCC has eliminated the uncertainty that regulation sometimes imposes on industry. This has allowed the capital markets and industry players to develop business plans and to invest capital to meet consumer demand.

The Federal approach has been very successful, so the states should seriously consider what benefits would derive from imposing multiple and perhaps wildly varying regulatory paradigms of their own. The impact to economic growth and jobs, as companies assess where to locate, shut down facilities and eliminate jobs, by adhering to the intransigent regime of the past as opposed to the flexibility afforded by Internet based applications such as VoIP, will be considerable. The FCC is continuing to investigate the best way to regulate – or not regulate – new technologies in the NPRMs (*Developing a Unified Intercarrier Compensation Regime*, CC Docket No. 01-92 and *IP-Enabled Services*, WC Docket No. 04-36, FCC 04-28).

Potential for Reducing Costs

As noted above, the use of the IP network is less costly than using the traditional public switched telephone network. Reduced costs result from the more efficient routing of traffic in the packet-switched IP network and from reduced regulatory burdens. The cable and power line technologies also benefit from facilities that are already in place, so

[65] See, US News & World Report, "Courting Calls – Telecom and Cable Firms Scramble to Offer Internet Calls"; by Mary Kathleen Flynn; Feb 2, 2004.

that a new network does not need to be deployed and the public switched telephone network does not have to be duplicated.

These new technologies have the potential to reduce costs for industry and consumers for several reasons. First, new technologies allow for new service offerings which compete with existing services. This new competition has the potential to reduce prices for new and existing services. For instance, aggressive pricing by mobile wireless providers has resulted in reduced long-distance rates and reduced priced for bundled services. Second, the new technologies create added value for consumers through new and advanced features not found in existing services. For instance, BPL has the potential to allow consumer control over common appliances in the home. With BPL it may be possible to network your alarm clock, light switches, alarm system and coffee maker via a high-speed connection. These new features and services may also drive down the prices of existing services. New technologies may add value by bringing advanced services to areas not served in the past. As FCC Chairman Michael Powell said regarding BPL, "It really has the potential of being the great broadband hope for most of rural America."[66] Finally, VoIP, through various technical delivery mechanisms (i.e. DSL, cable modem, Wi-Fi, WiMAX, Mobile-Fi), is providing real savings for consumers who can live with the service's short-comings.

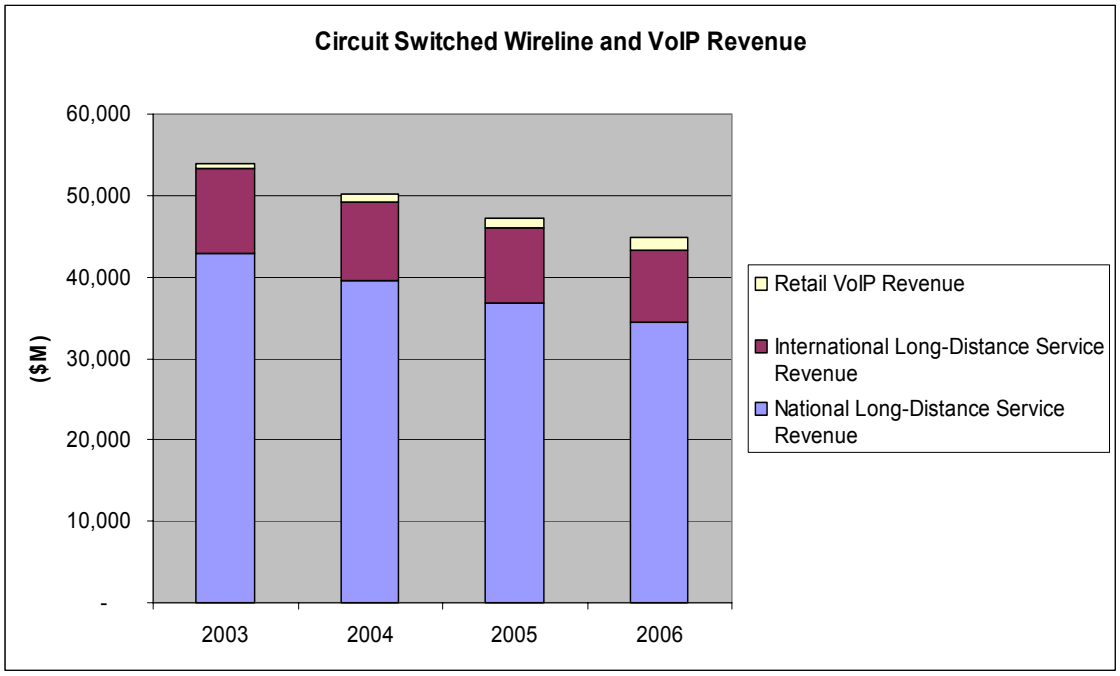
Potential Impacts on the WUSF

The new and varied technologies, and their associated offerings, may impact the WUSF over time. The impact, however, will be controlled in large part by how the FCC regulates these offerings. VoIP, for instance, is attractively priced today because the FCC has decided that "information services", such as IP to IP VoIP offerings, should not be burdened with the pricing structure of traditional telephone service. This has allowed providers to pass along those cost savings to consumers in the form of reduced rates. The

[66] See "Broadband Over Power Lines Gets a Boost, FCC will test alternative form of high-speed Net access"; PC World; dated February 13, 2004.

FCC has not, however, issued its final order on how such services are to be regulated. Some states have attempted to regulate VoIP offerings and to apply the taxes and surcharges found on traditional regulated phone service. A ruling by the FCC is expected in the next year.

The chart below provides a forecast of various traffic types over the next few years, and as you can see, IP-enabled voice traffic (VoIP) is not a significant portion of the total. [67] Today, traffic routed in that manner represents about 5 percent of the combined total of interexchange telecommunications traffic and VoIP traffic.



So, while IP-Enabled traffic is getting significant attention today, the volumes of traffic are not yet significant. Internet Protocol technologies are in their infancy from a market-penetration standpoint, and although they hold much promise, their market impact will be negligible in the foreseeable future.

[67] Gartner Group: United States: Fixed Public Network Services; April 2003.

Wireless offerings are popular and growing dramatically, but are not yet good substitutes for traditional telephone service. Wireless is still inferior in several important ways to wireline service. Wireline local service is very familiar to us all. Typical local service includes, but is not limited to, the ability to: make and receive voice telephone calls, get operator assistance, make and receive long distance calls (and to select your long distance providers), connect with emergency services by dialing 911, connect with an alarm company, use a fax machine to receive and send documents, get a dial-up or high-speed Internet connection, and have your number appear in the white pages of a telephone directory. While wireless service can provide many of these features, it is severely lacking in several areas. For instance, when you pick up your phone at your office you expect to receive dialtone and when the call connects you expect a high quality connection. Wireless service is known for variable quality of service based on the technology deployed, geographical features and the extent of deployment. Dropped calls and dead zones are common and, for customers of any single provider, reliable service is not available in many parts of the state (which parts may differ by provider).[68] Further, it would be difficult or impossible for a business to replace its high speed or even its dial-up Internet connection on the landline with a wireless counterpart.

The FCC found that "neither wireless nor cable has blossomed into a full substitute for wireline telephony."[69] The FCC also found that the fact that there is limited substitution demonstrates that "wireless switches do not yet act broadly as an intermodal replacement for traditional wireline circuit switches," and that "wireless CMRS connections in general do not yet equal traditional landline facilities in their quality."[70] Despite these findings, the industry expects increased gains by wireless as service quality, feature availability (E-911, broadband, number portability, etc.) and pricing become more comparable with

[68] The manual for AT&T wireless phones directs the customer to "move to a higher elevation, to a window or open space" when a call is dropped or you can't make a network connection. One does not have to suffer these inconveniences with a traditional landline phone.

[69] Before the Federal Communications Commission; REPORT AND ORDER AND ORDER ON REMAND AND FURTHER NOTICE OF PROPOSED RULEMAKING; CC Docket Nos. 01-338, 96-98, and 98-147; Released August 21, 2003, at ¶ 245.

[70] Id..

basic landline service. The next generation of wireless, know as 3G, will overcome many of the current shortcomings with the service and technology.

The other wireless technologies (Wi-Fi, WiMAX, Mobile-Fi, etc.) and the cable broadband offerings, while exciting in their promise and potential, are not expected to replace or supplant the traditional phone service in the near future. As such, the WUSF, which is funded through surcharges on existing traditional telephone lines, does not pose a risk to the traditional WUSF funding mechanism.

Alternative Uses of the WUSF to Support New, Low Cost Technologies

While the new technologies discussed above are not likely to have a near-term impact on the traditional WUSF funding mechanism, they are of interest from another WUSF-related standpoint. The new technologies discussed above may hold promise in that they may eventually be utilized to provide rural Wyoming telecommunications customers with telecommunications service at costs much lower than those we are currently experiencing. If costs can be reduced through the use of these newer technologies, the day may come when the WUSF is no longer needed to provide support in Wyoming's rural areas. Within this Report, QSI has identified the potential for reducing the size of the WUSF. If changes to the WUSF are implemented, which result in a reduction in the size of the WUSF, this reduction could obviously be "given back" to Wyoming consumers. Alternatively, the Wyoming Legislature could utilize these savings in such a way as to explore the potential benefits of these new technologies. Such an investment in Wyoming's future may provide long-term benefits to the State by eventually eliminating the need for universal service funding in what are currently "high cost" areas.

Conclusion and Recommended Legislative Action

While the new technologies discussed in this section of the Report are in various stages of development, the potential represented by these emerging technologies should not be

underestimated. Should the implementation of such technologies in Wyoming become reality, it would be possible to accomplish the goals of universal service – to ensure the general availability of essential telecommunications services at affordable and reasonable prices – in Wyoming, relying not on a system of subsidies and governmental programs, but on the free market and competitive forces. Therefore, in the near term, given this tremendous potential, QSI recommends that the Legislature provides additional funding for a study to be conducted which would accomplish the following critical objectives:

1. Identify technologies appropriate to Wyoming that could potentially eliminate the need for the WUSF by decreasing the costs of essential telecommunications services in rural and high cost areas of the State.
2. Examine potential avenues that would encourage the development of these technologies and that would allow these technologies to be brought to the market in Wyoming.
3. Examine potential regulatory roadblocks that exist and must be overcome before these technologies could be deployed in the state.
4. Project potential long-term savings to the state of such deployment.